

ARTICLES

TOXIC WASTES AND RACE AT TWENTY: WHY RACE STILL MATTERS AFTER ALL OF THESE YEARS

BY

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In 1987 the United Church of Christ's (UCC) Commission for Racial Justice published its landmark report Toxic Wastes and Race in the United States. The report documented disproportionate environmental burdens facing people of color and low-income communities across the country. The report sparked a national grassroots environmental justice movement and significant academic and governmental attention. In 2007, the UCC commissioned leading environmental justice scholars for a new report, Toxic Wastes and Race at Twenty: Grassroots Struggles to Dismantle Environmental Racism in the United States. In addition to commemorating and updating the 1987 report, the new report takes stock of progress achieved over the last twenty years.

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Although Toxic Wastes and Race has had tremendous positive impacts, twenty years after its release people of color and low-income communities are still the dumping grounds for all kinds of toxins. Using 2000 Census data, an updated database of commercial hazardous waste facilities, and newer methods that better match where people and hazardous sites are located, we found significant racial and socioeconomic disparities persist in the distribution of the nation's hazardous wastes facilities. We demonstrate that people of color are more concentrated around such facilities than previously shown. People of color are particularly concentrated in neighborhoods and communities with the greatest number of facilities and racial disparities continue to be widespread throughout the country. Moreover, hazardous waste host neighborhoods are composed predominantly of people of color. Race continues to be the predominant explanatory factor in facility locations and clearly still matters.

Yet getting government to respond to the needs of low-income and people of color communities has not been easy, especially in recent years when the U.S. Environmental Protection Agency has mounted an all-out attack on environmental justice principles and policies established in the 1990s. Environmental injustice results from deeply-embedded institutional discrimination and will require the support of concerned individuals, groups, and organizations from various walks of life. The Toxic Wastes and Race at Twenty report condensed in this Article provides dozens of recommendations for action at the federal, state, and local levels to help eliminate the disparities. The report also makes recommendations for nongovernmental organizations and industry. More than one hundred environmental justice, civil rights, human rights, faith based, and health allies signed a letter endorsing these steps to reverse recent backsliding, renewing the call for social, economic, and environmental justice for all. Congress has begun to listen and take action.

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I. INTRODUCTION

The environmental justice movement has come a long way since its humble beginning in Warren County, North Carolina, where a PCB (polychlorinated biphenyl) landfill ignited protests and more than 500 arrests.¹ Although the demonstrators were unsuccessful in stopping the siting of the PCB landfill, they put “environmental racism” on the map and launched the national environmental justice movement. The Warren County protests also led the United Church of Christ Commission for Racial Justice in 1987 to produce *Toxic Wastes and Race*, the first national study to correlate waste facility sites and demographic characteristics.²

The 1987 report was significant because it found race to be the most potent variable in predicting where these facilities were located—more powerful than household income, the value of homes, and the estimated amount of hazardous waste generated by industry.³ The *Toxic Wastes and Race* study was revisited in 1994 using 1990 census data.⁴ The 1994 study found that people of color are 47% more likely to live near a hazardous waste facility than white Americans.⁵

It has now been two decades since *Toxic Wastes and Race* was first published. Over the past twenty years, environmental justice and environmental racism have become household words. Out of the small and seemingly isolated environmental struggles emerged a potent grassroots community-driven movement. Many of the on-the-ground environmental struggles in the 1980s, 1990s, and through the early years of the new millennium have seen the quest for environmental and economic justice become a unifying theme across race, class, gender, age, and geographic lines.

The “chicken or egg” wastes facility siting debate has nearly been put to rest since recent evidence shows that the disproportionately high percentages of minorities and low-income populations were present at the time the commercial hazardous waste facilities were sited. A 2001 study confirms this phenomenon in Los Angeles County.⁶ Likewise in a 2005 study our authors Robin Saha and Paul Mohai report that in Michigan during the last thirty years commercial hazardous waste facilities were sited in neighborhoods that were disproportionately poor and disproportionately non-white at the time of siting.⁷

¹ EILEEN MCGURTY, TRANSFORMING ENVIRONMENTALISM: WARREN COUNTY, PCBs, AND THE ORIGINS OF ENVIRONMENTAL JUSTICE 9 (2007); ROBERT D. BULLARD, DUMPING IN DIXIE: RACE, CLASS, AND ENVIRONMENTAL QUALITY 29–31 (3d ed. 2000).

² COMM’N FOR RACIAL JUSTICE, UNITED CHURCH OF CHRIST, TOXIC WASTES AND RACE IN THE UNITED STATES (1987), available at <http://www.ucc.org/about-us/archives/pdfs/toxwrace87.pdf> [hereinafter TOXIC WASTES AND RACE]; MCGURTY, *supra* note 1, at 116.

³ TOXIC WASTES AND RACE, *supra* note 2.

⁴ BENJAMIN A. GOLDMAN & LAURA J. FITTON, TOXIC WASTES AND RACE REVISITED (1994), available at <http://www.stateaction.org/publications/pdf/toxicwastes.pdf> [hereinafter TOXIC WASTES AND RACE REVISITED].

⁵ *Id.* at 1.

⁶ Manuel Pastor Jr., Jim Sadd & John Hipp, *Which Came First? Toxic Facilities, Minority Move-In, and Environmental Justice*, 23 J. URB. AFF. 1, 9 (2001).

⁷ Robin Saha & Paul Mohai, *Historical Context and Hazardous Waste Facility Siting:*

In 2007, Mohai and Saha provided compelling evidence of the demographic composition at or near the time of siting for the neighborhoods of the 413 facilities examined in the *Toxic Wastes and Race at Twenty* report.⁸ Again, their research found that nationally commercial hazardous waste facilities sited since 1965 have been sited in neighborhoods that were disproportionately minority at the time of siting.

After two decades of intense study, targeted research, public hearings, grassroots organizing, networking, and movement building, environmental justice struggles have taken center stage.⁹ Yet, all communities are still not created equal. Some neighborhoods, communities, and regions are still the dumping grounds for all kinds of toxins. Low-income and people of color populations are still left behind before and after natural and man-made disasters strike—as graphically demonstrated on August 29, 2005 when Hurricane Katrina made landfall and the levee breach flooded New Orleans, creating the “worst environmental disaster” in U.S. history.¹⁰

II. ROOTS OF ENVIRONMENTAL JUSTICE SINCE 1987

While communities across the nation celebrated the twentieth anniversary of *Toxic Wastes and Race*, they knew all too well that there was still much work to be done before we achieve the goal of environmental justice for all. Much progress has been made in mainstreaming environmental protection as a civil rights and social justice issue. The key is getting government to enforce the laws and regulations equally across the board—without regard to race, color, or national origin.

The last two decades have seen some positive change in the way groups relate to each other. We now see an increasing number of community based groups, environmental justice networks, environmental and conservation groups, legal groups, faith-based groups, labor, academic institutions, and youth organizations teaming up on environmental and health issues that differentially impact poor people and people of color. Environmental racism and environmental justice panels have become “hot” topics at national conferences and forums sponsored by law schools, bar associations, public health groups, scientific societies, professional meetings, and university lecture series.

In 2007, the United Church of Christ Justice and Witness Ministries released a new report as part of the twentieth anniversary of the release of the 1987 report. The 2007 *Toxic Wastes and Race at Twenty* report uses 2000

Understanding Temporal Patterns in Michigan, 52 SOC. PROBS. 618, 634–35 (2005).

⁸ PAUL MOHAI & ROBIN SAHA, WHICH CAME FIRST, PEOPLE OR POLLUTION? HOW RACE AND SOCIOECONOMIC STATUS AFFECT ENVIRONMENTAL JUSTICE 634 (2007) (the authors presented this report at the Annual Meeting of the American Association for the Advancement of Science (AAAS) held in San Francisco, CA on February 17, 2007).

⁹ ROBERT D. BULLARD, THE QUEST FOR ENVIRONMENTAL JUSTICE: HUMAN RIGHTS AND THE POLITICS OF POLLUTION 1–2 (2005).

¹⁰ MANUEL PASTOR ET AL., IN THE WAKE OF THE STORM: ENVIRONMENT, DISASTER AND RACE AFTER KATRINA 1 (2006).

census data.¹¹ The report also chronicles important environmental justice milestones since 1987 and a collection of “impact” essays from environmental justice leaders on a range of topics. This new report examines the environmental justice implications in post-Katrina New Orleans and uses the Dickson County (Tennessee) Landfill case—the “poster child” for environmental racism—to illustrate the deadly mix of waste and race.¹² *Toxic Wastes and Race at Twenty* is designed to facilitate renewed grassroots organizing and provide a catalyst for local, regional, and national environmental justice public forums, discussion groups, and policy changes in 2007 and beyond.

The research was guided by the following questions:

- (1) What are the core or fundamental environmental justice issues surrounding waste and race?
- (2) What role has government played over the past two decades to address waste facility siting and related environmental disparities?
- (3) What progress has been made and what challenges exist?
- (4) What resources exist or need to be brought to bear to address the environmental justice issues?
- and (5) What policy and legislative changes are needed to address adverse and disproportionate impacts of environmental and health threats to low-income and people of color populations and to ensure equal environmental protection for all?¹³

A new movement has taken root in the United States, and spread around the world, that defines environment as “everything”—where we live, work, play, worship, and go to school, as well as the physical and natural world. This relatively new national movement is called the environmental and economic justice movement. Two decades ago, the concept of environmental justice had not registered on the radar screens of environmental, civil rights, human rights, or social justice groups. Nevertheless, one should not forget that Dr. Martin Luther King Jr. went to Memphis in 1968 on an environmental and economic justice mission for the striking black garbage workers.¹⁴ The strikers were demanding equal pay and better work conditions. Of course, Dr. King was assassinated before he could complete his mission.

In 1998, the U.S. Environmental Protection Agency (EPA) defined environmental justice as the

fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic,

¹¹ ROBERT D. BULLARD, PAUL MOHAI, ROBIN SAHA & BEVERLY WRIGHT, UNITED CHURCH OF CHRIST, *TOXIC WASTES AND RACE AT TWENTY* 1 (2007) [hereinafter *TOXIC WASTES AND RACE AT TWENTY*].

¹² *Id.* at 134–51.

¹³ *Id.* at 1.

¹⁴ MICHAEL K. HONEY, *GOING DOWN JERICHO ROAD: THE MEMPHIS STRIKE, MARTIN LUTHER KING'S LAST CAMPAIGN* 292 (2007).

or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.¹⁵

Simply put, environmental justice demands that everyone—not just the people who can “vote with their feet” and move away from threats or individuals who can afford lawyers, experts, and lobbyists to fight on their behalf—is entitled to equal protection and equal enforcement of our environmental, health, housing, land use, transportation, energy, and civil rights laws and regulations.

Clearly, the world is much different since the *Toxic Wastes and Race* report was first published in 1987. The UCC report propelled an entire generation of social science researchers investigating the interplay between race, class, and the environment. The landmark study also spawned a series of academic books, including *Dumping in Dixie: Race, Class, and Environmental Quality* in 1990, the first to chronicle the convergence of two movements—the social justice movement and environmental movement—into the environmental justice movement.¹⁶ It also highlighted African Americans’ environmental activism in the South, the same region that gave birth to the modern civil rights movement. What started out as local and often isolated community-based struggles against toxics and facility siting blossomed into a multi-issue, multi-ethnic, and multi-regional movement.

Two years later, in 1992, *Race and the Incidence of Environmental Hazards: A Time for Discourse* brought together papers from scholars, activists, and policy analysts who had attended an historic environmental justice conference sponsored by Professors Bunyan Bryant and Paul Mohai at the University of Michigan School of Natural Resources and Environment.¹⁷ A half-dozen presenters from this historic gathering—which later became known as the “Michigan Coalition”—pressured the EPA to begin addressing environmental justice concerns voiced by low-income and people of color communities from around the country. In July 1992, after much prodding from environmental justice advocates, the EPA published *Environmental Equity: Reducing Risks for All Communities*, one of the first EPA reports to acknowledge environmental disparities by race and class.¹⁸

It is no accident that the Commission for Racial Justice, under the leadership of Reverend Benjamin Chavis, also was the impetus behind the First National People of Color Environmental Leadership Summit. The 1991 Summit was probably the most important single event in the movement’s

¹⁵ U.S. ENVTL. PROT. AGENCY, FINAL GUIDANCE FOR INCORPORATING ENVIRONMENTAL JUSTICE IN EPA’S NEPA COMPLIANCE ANALYSIS 7–8 (1998), available at http://www.epa.gov/compliance/resources/policies/ej/ej_guidance_nepa_epa0498.pdf.

¹⁶ BULLARD, *supra* note 1, at xiii.

¹⁷ RACE AND THE INCIDENCE OF ENVIRONMENTAL HAZARDS: A TIME FOR DISCOURSE (Bunyan Bryant & Paul Mohai eds., 1992).

¹⁸ U.S. ENVTL. PROT. AGENCY, ENVIRONMENTAL EQUITY: REDUCING RISKS FOR ALL COMMUNITIES 1–2 (1992), available at http://www.epa.gov/compliance/resources/publications/ej/annual-project-reports/reducing_risk_com_vol2.pdf.

history. The Summit broadened the environmental justice movement beyond its early anti-toxics focus to include issues of public health, worker safety, land use, transportation, housing, resource allocation, and community empowerment. The meeting also demonstrated that it is possible to build a multi-racial grassroots movement around environmental and economic justice.¹⁹

Held in Washington, D.C., the four-day Summit was attended by more than 650 grassroots and national leaders from around the world. Delegates came from all fifty states, Puerto Rico, Chile, Mexico, and as far away as the Marshall Islands. People attended the Summit to share their action strategies, redefine the environmental movement, and develop common plans for addressing environmental problems affecting people of color in the United States and around the world.

On October 27, 1991, Summit delegates adopted seventeen “Principles of Environmental Justice.” These principles were developed as a guide for organizing, networking, and relating to government and nongovernmental organizations (NGOs). By June 1992, Spanish and Portuguese translations of the Principles were being used and circulated by NGOs and environmental justice groups at the Earth Summit in Rio de Janeiro. And in September 2002, the UCC helped facilitate the Second People of Color Environmental Leadership Summit (EJ Summit II) in Washington, D.C. The EJ Summit II was planned for 500 delegates. However, more than 1400 individuals participated in this historic event—a clear indication that the environmental justice movement is alive and well.

III. TOXIC NEIGHBORHOODS

Despite progress in research, planning, and policy, low-income and people of color neighborhoods and their residents suffer from greater environmental risks than the larger society. For example, lead poisoning continues to be the number-one environmental health threat to children in the United States, especially poor children, children of color, and children living in older housing in inner cities.²⁰ “Black children are five times more likely than white children to have lead poisoning”²¹ and “[o]ne in seven black children living in older housing has elevated blood lead levels.”²²

About 22% of African American children and 13% of Mexican American children living in pre-1946 housing suffer from lead poisoning, compared with 6% of white children living in comparable types of housing.²³ Recent

¹⁹ See Dana Alston, *Transforming a Movement: People of Color Unite at Summit Against Environmental Racism*, SOJOURNER, Jan. 1992, at 30–31.

²⁰ TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 3.

²¹ *Id.*

²² Trust for America’s Health, Health Disparities, <http://healthyamericans.org/topics/index.php?TopicID=20> (last visited Mar. 5, 2008).

²³ See U.S. CTRS. FOR DISEASE CONTROL & PREVENTION, RECOMMENDATIONS FOR BLOOD LEAD SCREENING OF YOUNG CHILDREN ENROLLED IN MEDICAID: TARGETING A GROUP AT HIGH RISK, 49 MORBIDITY & MORTALITY WKLY REP. No. RR-14, at 3 (2000).

studies suggest that a young person's lead burden is linked to lower IQ, lower high school graduation rates, and increased delinquency.²⁴ Lead poisoning causes about two to three points of IQ lost for each 10 ug/dl lead level.²⁵

The nation's environmental laws, regulations, and policies are not applied uniformly, resulting in some individuals, neighborhoods, and communities being exposed to elevated health risks. In 1992, staff writers from *The National Law Journal* uncovered glaring inequities in the way the federal EPA enforces its laws.²⁶ The authors write:

There is a racial divide in the way the U.S. government cleans up toxic waste sites and punishes polluters. White communities see faster action, better results and stiffer penalties than communities where blacks, Hispanics and other minorities live. This unequal protection often occurs whether the community is wealthy or poor.²⁷

These findings suggest that unequal protection is placing communities of color at special risk. The *National Law Journal* study supplements the findings of earlier studies and reinforces what many grassroots leaders have been saying all along: namely, people of color are differentially impacted by industrial pollution and they also can expect different treatment from the government. Environmental decision making operates at the juncture of science, economics, politics, special interests, and ethics. The question of environmental justice is not anchored in a debate about whether or not decision makers should tinker with risk management. The framework seeks to prevent environmental threats before they occur.²⁸

The U.S. Government Accountability Office (formerly the U.S. General Accounting Office) estimates that there are up to 450,000 brownfields (abandoned waste sites) scattered throughout the urban landscape from New York to California—most of which are located in or near low income, working class, and people of color communities.²⁹ More than 870,000 of the 1.9 million housing units for the poor, who are mostly minorities, sit “within about a mile of factories that reported toxic emissions to the Environmental Protection Agency.”³⁰

More than 600,000 students in Massachusetts, New York, New Jersey, Michigan, and California attend nearly 1200 public schools—with

²⁴ Peter Montague, *Pediatricians Urge a Precautionary Approach to Toxic Lead*, ENVIRONMENTAL RESEARCH FOUNDATION, <http://www.rachel.org/en/node/6426> (last visited Apr. 13, 2008).

²⁵ *Id.*

²⁶ Marianne Lavelle & Marcia Coyle, *Unequal Protection: The Racial Divide in Environmental Law*, NAT'L L.J. S1–S2 (1992).

²⁷ *Id.*

²⁸ See Robert D. Bullard, *Race and Environmental Justice in the United States*, 18 YALE J. INT'L L. 319, 334 (1993); see also Robert D. Bullard, *The Threat of Environmental Racism*, 7 NAT. RESOURCES & ENV'T 23, 56 (1993).

²⁹ See Renée Twombly, *Urban Uprising*, 105 ENVTL. HEALTH PERSP. 696, 698–99 (1997).

³⁰ *Study: Public Housing Is Too Often Located Near Toxic Sites*, CNN.com, Oct. 13, 2000, <http://www.cnn.com/2000/NATURE/10/03/toxicneighbors.ap/> (last visited Apr. 13, 2008).

populations largely made up of African Americans and other children of color—that are located within a half mile of federal Superfund or state-identified contaminated sites.³¹ An astounding “68 percent of African Americans live within 30 miles of a coal-fired power plant—the distance within which the maximum effects of the smokestack plume are expected to occur”—compared with 56% of white Americans.³²

In September 2005, the Associated Press (AP) released results from its analysis of an EPA research project showing African Americans are “79 percent more likely than whites to live in neighborhoods where industrial pollution is suspected of posing the greatest health danger.”³³ Using EPA’s own data and government scientists, the AP study, *More Blacks Live with Pollution*, revealed that “[i]n 19 states, blacks were more than twice as likely as whites to live in neighborhoods where air pollution seems to pose the greatest health danger.”³⁴ Hispanics and Asians also are more likely to breathe dirty air in some regions of the United States. The AP study found that residents of the at-risk neighborhoods were generally poorer and less educated, and unemployment rates in those districts were nearly 20% higher than the national average.³⁵

The AP study analyzed the health risk posed by industrial air pollution using toxic chemical air releases reported by factories to calculate a health risk score for each square kilometer of the United States.³⁶ The scores can be used to compare risks from long-term exposure to factory pollution from one area to another. The scores are based on the amount of toxic pollution released by each factory, the path the pollution takes as it spreads through the air, the level of danger to humans posed by each different chemical released, and the number of males and females of different ages who live in the exposure paths.³⁷

IV. GOVERNMENT RESPONSE TO ENVIRONMENTAL INJUSTICE

The mission of the federal EPA was never designed to address environmental policies and practices that result in unfair, unjust, and inequitable outcomes. EPA is a regulatory agency, not a health agency. However, many of its regulations are health based. EPA and other government officials are not likely to ask the questions that go to the heart of environmental injustice: What groups are most affected? Why are they

³¹ See CHILD PROOFING OUR COMMUNITIES CAMPAIGN, CTR. FOR HEALTH, ENV’T & JUSTICE, POISONED SCHOOLS: INVISIBLE THREATS, VISIBLE ACTIONS, available at http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/19/33/92.pdf.

³² GEORGIA COAL FOR THE PEOPLES AGENDA, THE S. ORG. COMM. FOR ECON. AND SOC. JUSTICE, AIR OF INJUSTICE: AFRICAN AMERICANS AND POWER PLANT POLLUTION 3 (2002), available at <http://cta.policy.net/proactive/newsroom/release.vtml?id=23901>.

³³ David Pace, *More Blacks Live with Pollution*, ASSOCIATED PRESS, <http://hosted.ap.org/specials/interactives/archive/pollution/part1.html> (last visited Apr. 13, 2008).

³⁴ *Id.*

³⁵ *Id.*

³⁶ *Id.*

³⁷ *Id.*

affected? Who did it? What can be done to remedy the problem? How can communities be justly compensated and reparations paid to individuals harmed by industry and government actions? How can the problem be prevented? Vulnerable communities, populations, and individuals often fall between the regulatory cracks. They are in many ways “invisible” communities.³⁸ The environmental justice movement served to make these disenfranchised communities visible and vocal.

Despite significant improvements in environmental protection over the past several decades, millions of Americans continue to live, work, play, and go to school in unsafe and unhealthy physical environments.³⁹ Over the past two decades, the U.S. EPA has not always recognized that many of our government and industry practices—whether intended or unintended—have adverse impacts on poor people and people of color.⁴⁰ Racial discrimination is a fact of life in America even though it is unjust, unfair, and illegal; discrimination continues to deny millions of Americans their basic civil and human rights.

For decades, grassroots activists have been convinced that waiting for the government to act has endangered the health and welfare of their communities.⁴¹ Unlike the federal EPA, communities of color did not first discover environmental inequities in the 1990s. EPA only took action on environmental justice concerns in 1990 after extensive prodding from grassroots environmental justice activists, educators, and academics.⁴² In 1990, after receiving a letter from the Michigan Coalition, EPA administrator William Reilly established the Environmental Equity Work Group and set up a series of meetings on environmental justice with grassroots leaders. In 1991, the Agency for Toxic Substances and Disease Registry convened the National Minority Environmental Health Conference in Atlanta, Georgia. A host of research scientists presented facts and figures detailing elevated environmental health risks experienced by people of color. As it turned out, having the facts was not sufficient to get the government to act, especially when the problem disproportionately affects poor people and people of color.

Environmental justice advocates continue to challenge the current environmental protection apparatus and offer their own framework for addressing environmental racism, unequal protection, health disparities, and

³⁸ See ROBERT D. BULLARD, *INVISIBLE HOUSTON: THE BLACK EXPERIENCE IN BOOM AND BUST* 60–75 (1987); Robert D. Bullard, *Dumping on Houston's Black Neighborhoods*, in *ENERGY METROPOLIS: AN ENVIRONMENTAL HISTORY OF HOUSTON AND THE GULF COAST* 207–23 (Martin V. Melosi & Joseph A. Pratt eds., 2007).

³⁹ See Paul Mohai & Bunyan Bryant, *Race, Poverty, and the Environment*, 18 *EPA J.* 6, 6–8 (1992); Robert D. Bullard, *In Our Backyards*, *EPA J.*, *supra*, at 11–12; Patrick C. West, *Health Concerns for Fish-Eating Tribes?*, *EPA J.*, *supra*, at 15–16; D.R. Wernette & L.A. Nieves, *Breathing Polluted Air*, *EPA J.*, *supra*, at 16–17.

⁴⁰ ROBERT W. COLLIN, *THE ENVIRONMENTAL PROTECTION AGENCY: CLEANING UP AMERICA'S ACT* 106–18 (2006).

⁴¹ See, e.g., Robert D. Bullard & Beverly H. Wright, *The Politics of Pollution: Implications for the Black Community*, 47 *PHYLON* 71, 75 (1986).

⁴² William K. Reilly, *Environmental Equity: EPA's Position*, 18 *EPA J.* *supra* note 39, at 18.

unsustainable development in the United States and around the world.⁴³ After much prompting from environmental justice advocates, the EPA created the Office of Environmental Justice in 1992 and implemented a new organizational infrastructure to integrate environmental justice into its policies, programs, and activities.

The EPA produced its own study, *Environmental Equity: Reducing Risks for All Communities*, finally acknowledging the fact that some populations shoulder greater environmental health risks than others.⁴⁴ The report found clear differences between racial groups in terms of disease and death rates; racial minority and low-income populations experience higher than average exposures to selected air pollutants, hazardous waste facilities, contaminated fish, and agricultural pesticides in the workplace; and great opportunities exist for EPA and other government agencies to improve communication about environmental problems with members of low-income and racial minority groups.

In September 1993, EPA established the National Environmental Justice Advisory Council (NEJAC). The NEJAC was the first time that representatives from the community, academia, industry, environmental, and indigenous groups, as well as state, local, and tribal governments, were brought together in an effort to create a dialogue that can define and “reinvent” solutions to environmental justice problems.

In response to growing public concern and mounting scientific evidence, President William Clinton issued Executive Order 12,898, entitled Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, on February 11, 1994,⁴⁵ which was the second day of a national Symposium on Health Research Needs to Ensure Environmental Justice. This Order attempts to address environmental injustice within existing federal laws and regulations.

Executive Order 12,898 reinforces the four-decade-old Civil Rights Act of 1964, Title VI, which prohibits discriminatory practices in programs receiving federal funds.⁴⁶ The Order also focuses the spotlight back on the National Environmental Policy Act (NEPA), a law that requires examination of a project’s environmental impacts.⁴⁷ NEPA’s goal is to ensure for all Americans a safe, healthful, productive, and aesthetically and culturally pleasing environment.⁴⁸ NEPA requires federal agencies to prepare a detailed statement on the environmental effects of proposed federal actions that significantly affect the quality of human health.⁴⁹

⁴³ See generally JUST SUSTAINABILITIES: DEVELOPMENT IN AN UNEQUAL WORLD (Julian Agyeman et al. eds., 2003).

⁴⁴ U.S. ENV’T L. PROT. AGENCY, ENVIRONMENTAL EQUITY: REDUCING RISKS FOR ALL COMMUNITIES 1–2 (1992), available at http://www.epa.gov/Compliance/resources/publications/ej/annual-project-reports/reducing_risk_com_vol2.pdf.

⁴⁵ Exec. Order No. 12,898, 59 Fed. Reg. 7,629 (Feb. 11, 1994).

⁴⁶ Civil Rights Act of 1964, 42 U.S.C. §§ 2000d–2000d-1 (2000).

⁴⁷ National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321–4370e (2000).

⁴⁸ *Id.* at § 4332(2)(C).

⁴⁹ *Id.*

The Executive Order called for improved methodologies for assessing and mitigating impacts, health effects from multiple and cumulative exposure, collection of data on low-income and minority populations who may be disproportionately at risk, and impacts on subsistence fishers and consumers of wild game.⁵⁰ It also encourages participation of the impacted populations in the various phases of assessing impacts—including scoping, data gathering, alternatives, analysis, mitigation, and monitoring.⁵¹

The EPA has a spotty record protecting environmental civil rights under the statutory authority of Title VI of the Civil Rights Act, which prohibits discrimination on the bases of race, color, and national origin.⁵² Federal agencies and recipients of federal assistance, including state environmental permitting programs, must ensure compliance with Title VI implementing regulations, and they must ensure prompt and fair resolution of discrimination complaints. In 1998, the EPA's Office of Civil Rights (OCR) issued its *Interim Guidance for Investigating Title VI Civil Rights Complaints*, which provides a framework for processing environmental discrimination complaints.⁵³

The Clinton Administration continued and expanded many of the policies, programs, and initiatives that began under the first Bush Administration. However, beginning in 2000 and continuing to the present day, environmental justice stalled and has met intense resistance inside the EPA through proposed budget and program cuts.⁵⁴ In August 2000, 125 community groups, environmental justice organizations, coalitions, networks, individuals, and an Indian nation provided testament of how their administrative complaints had languished for years in a comment on revision to the *Interim Guidance*.⁵⁵ By 2001 more than 100 complaints had been filed, however, few had been resolved due to the often inadequate investigation as demonstrated in the Select Steel case in Michigan.⁵⁶ Furthermore, no rulings were in favor of the complainant, in what amounts to a "conscious policy of non-enforcement."⁵⁷ Although the EPA issued its final guidance in March 2006, it has yet to develop legally binding standards for what constitutes an adverse disparate impact and continues to abrogate

⁵⁰ Exec. Order No. 12,898, 59 Fed. Reg. 7,629 (Feb. 11, 1994).

⁵¹ *Id.*

⁵² Civil Rights Act of 1962 § 2000d (2000).

⁵³ U.S. Env'tl. Prot. Agency, *Process For Revising EPA's Interim Guidance for Investigating Title VI Administrative Complaints Challenging Permits*, <http://www.epa.gov/ocr/reviguid2.htm> (last visited Apr. 13, 2008).

⁵⁴ TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 13.

⁵⁵ Comments on Draft Revised Guidance for Investigating Title VI Administrative Complaints Challenging Permits and Draft Title IV Guidance for EPA Assistance Recipients Administering Environmental Permitting Programs from Luke Cole, Center on Race, Poverty & the Environment to Carol Browner, Administrator, U.S. Environmental Protection Agency 1-4 (Aug. 26, 2000), available at www.epa.gov/ocr/docs/t6com2000/t6com2000_071.pdf.

⁵⁶ Eric C. Tassone & Lance A. Waller, *Special Reports: Environmental Justice, GIS and the Select Steel Case*, 37 PUB. HEALTH GIS NEWS & INFO., Nov. 2000, at 10-11, available at <http://www.cdc.gov/nchs/data/gis/cdcgis37.pdf>.

⁵⁷ Julia H. Hurwitz & E. Quita Sullivan, *Using Civil Rights Laws to Challenge Environmental Racism: From Bean to Guardians to Chester to Sandoval*, 2 J.L. SOC'Y 52, 52 (2001).

its enforcement responsibility to oversee discriminatory practices of state environmental agencies in a credible manner.

In January and February 2003, the U.S. Commission on Civil Rights (USCCR) held hearings on environmental justice. Experts presented evidence of environmental inequities in communities of color, including disproportionate incidences of environmentally related disease, lead paint in homes, hazardous waste sites, toxic playgrounds, and schools located near Superfund sites and facilities that release toxic chemicals. In its 2003 report *Not in My Backyard: Executive Order and Title VI as Tools for Achieving Environmental Justice*, the USCCR concluded that “minority and low-income communities are most often exposed to multiple pollutants from multiple sources. . . . [T]here is no presumption of adverse health risk from multiple exposures, and no policy on cumulative risk assessment that considers the roles of social, economic and behavioral factors when assessing risk.”⁵⁸ The report was distributed to members of Congress and President George Bush.

A March 2004 Office of Inspector General (OIG) report, *EPA Needs to Consistently Implement the Intent of the Executive Order on Environmental Justice*, summed up the treatment of environmental justice under the Bush administration. After a decade, EPA “has not developed a clear vision or a comprehensive strategic plan, and has not established values, goals, expectations and performance measurements” for integrating environmental justice into its day-to-day operations.⁵⁹

A July 2005 U.S. Government Accountability Office report, *Environmental Justice: EPA Should Devote More Attention to Environmental Justice When Developing Clean Air Rules*, also criticized EPA for its handling of environmental justice issues when drafting clean air rules.⁶⁰ In July 2005, the EPA was met with a firestorm of public resistance when it proposed dropping race from its draft Environmental Justice Strategic Plan as a factor in identifying and prioritizing populations that may be disadvantaged by the agency’s policies.⁶¹

In the Fall of 2005, the EPA announced plans to change the Toxic Release Inventory (TRI) program. According to many environmental advocates, the changes would severely weaken the program, deny the public information, and set back EPA efforts to confront the most serious public issues related to toxic chemicals. In July 2006, EPA’s Science Advisory Board Committee opposed these changes in a harsh letter to EPA administrator Stephen L. Johnson.⁶²

⁵⁸ U.S. COMM’N ON CIVIL RIGHTS, *NOT IN MY BACKYARD: EXECUTIVE ORDER 12898 AND TITLE VI AS TOOLS FOR ACHIEVING ENVIRONMENTAL JUSTICE* 27 (2003).

⁵⁹ OFFICE OF THE INSPECTOR GEN., U.S. ENV’T’L PROT. AGENCY, *EPA NEEDS TO CONSISTENTLY IMPLEMENT THE INTENT OF THE EXECUTIVE ORDER ON ENVIRONMENTAL JUSTICE* REP. NO. 2004-P-00007, at i (2004).

⁶⁰ U.S. GOV’T ACCOUNTABILITY OFFICE, *ENVIRONMENTAL JUSTICE: EPA SHOULD DEVOTE MORE ATTENTION TO ENVIRONMENTAL JUSTICE WHEN DEVELOPING CLEAN AIR RULES* 3–6 (2005).

⁶¹ Manu Raju, *EPA’s Draft Equity Plan Drops Race as a Factor in Decisions*, INSIDE EPA, July 1, 2005, http://www.precaution.org/lib/06/prm_epa_drops_race_from_ej_guide.050701.htm (Apr. 13, 2008).

⁶² *EPA’s Science Advisory Board Opposes TRI Proposals*, 7 OMB WATCH 15, July 25, 2006,

In December 2006, the EPA announced final rules that undermine this critical program by eliminating detailed reports from more than 5000 facilities that release up to 2000 pounds of chemicals every year. They also eliminated detailed reports from nearly 2000 facilities that manage up to 500 pounds of chemicals known to pose some of the worst threats to human health, including lead and mercury.⁶³ Some of the extraneous changes include a two year reporting requirement (instead of the more adequate yearly reporting currently in place), raising the threshold amount required to report toxic releases, the elimination of more detailed compulsory industry reporting, and the weakening of other important programs at EPA because of the lack of relevant information previously generated with TRI data.⁶⁴ The program was widely credited with reducing releases of program chemicals by 65%.

Similarly, an October 2007 GAO report indicates that EPA's recent rules weakening TRI could reduce availability of toxic chemical information used to assess environmental justice and reduce the amount of information about toxic chemical releases, without providing significant savings to facilities.⁶⁵ According to the GAO, EPA's new rules would make significantly less information available to communities, but would save companies little—an average of less than \$900 per facility.⁶⁶

In September 2006, the EPA's Office of Inspector General (IG) issued another study, *EPA Needs to Conduct Environmental Reviews of Its Program, Policies, and Activities*, chastising the agency for falling down on the job when it comes to implementing environmental justice reviews.⁶⁷ The IG study may be new but its findings are not. The IG recommended and EPA accepted the following recommendations:

- Require the Agency's program and regional offices to identify which programs, policies, and activities need environmental justice reviews and require these offices to establish a plan to complete the necessary reviews.
- Ensure that environmental justice reviews determine whether the programs, policies, and activities may have a disproportionately high and adverse health or environmental impact on minority and low-income populations.
- Require each program and regional office to develop, with the assistance of the Office of Environmental Justice, specific environmental justice review guidance, which includes protocols, a framework, or directions for conducting environmental justice reviews.

<http://www.ombwatch.org/article/articleview/3526/1/241?TopicID=1> (last visited Apr. 13, 2008).

⁶³ U.S. GOV'T ACCOUNTABILITY OFFICE, ENVIRONMENTAL RIGHT-TO-KNOW: EPA'S RECENT RULE COULD REDUCE AVAILABILITY OF TOXIC CHEMICAL INFORMATION USED TO ASSESS ENVIRONMENTAL JUSTICE, TESTIMONY BEFORE THE SUBCOMMITTEE ON ENVIRONMENT AND HAZARDOUS MATERIALS, COMMITTEE ON ENERGY AND COMMERCE, HOUSE OF REPRESENTATIVES, *available at* <http://www.gao.gov/new.items/d08115t.pdf>.

⁶⁴ *Id.* at 2.

⁶⁵ *Id.* at 5.

⁶⁶ *Id.* at 6.

⁶⁷ U.S. OFFICE OF INSPECTOR GEN., EPA NEEDS TO CONDUCT ENVIRONMENTAL JUSTICE REVIEWS OF ITS PROGRAMS, POLICIES, AND ACTIVITIES 5 (2006).

- Designate a responsible office to (a) compile the results of environmental justice reviews, and (b) recommend appropriate actions to review findings and make recommendations to the decision-making office's senior leadership.⁶⁸

In the fall of 2006, EPA continued to dismantle long-standing environmental justice initiatives around the country. The EPA's Northwest regional office announced the elimination of the local environmental justice office. The proposal calls for reassigning members of its environmental justice program to new divisions and eliminating its director's position.⁶⁹ According to EPA officials, the changes are part of ongoing staff cuts and reorganization at the agency, but they will not diminish the importance of environmental justice or civil rights issues.⁷⁰

V. ASSESSING DISPARITIES IN ENVIRONMENTAL BURDENS

As mentioned, the publication in 1987 of *Toxic Wastes and Race* led to increased public awareness about disproportionate environmental burdens in people of color communities and fueled the growing environmental justice movement. It also led to a closer examination by academic researchers of the claims in the report and social movement addressing the extent, causes, and consequences of disproportionate environmental burdens. Indeed, the number of research studies examining racial and socioeconomic disparities around environmentally hazardous sites has grown dramatically and steadily over the twenty years since publication of *Toxic Wastes and Race*.

In that time period, three systematic reviews of the existing research have been conducted.⁷¹ All these reviews have found a preponderance of evidence that environmental hazards of a wide variety are distributed inequitably by race and socioeconomic status. Most subsequent studies have found racial and socioeconomic disparities to be statistically significant, but the disparities often have been found to be modest.⁷² In 2006, Professors Paul Mohai and Robin Saha explained how much of the early environmental justice

⁶⁸ *Id.* at 7–8.

⁶⁹ Lisa Stiffler, *EPA Budget Reduction Could Expose More Minorities, Poor to Pollution*, SEATTLE POST-INTELLIGENCER, Oct. 16, 2006, at A1.

⁷⁰ James Hagengruber, *EPA Cutbacks Greeted with Criticism: Groups Say Office of Civil Rights and Environmental Justice Gutted*, SPOKESMAN-REV., Oct. 31, 2006, at 1B.

⁷¹ Paul Mohai & Bunyan Bryant, *Environmental Racism: Reviewing the Evidence*, in RACE AND THE INCIDENCE OF ENVIRONMENTAL HAZARDS 163–76 (Paul Mohai & Bunyan Bryant eds., 1992); Benjamin A. Goldman, NOT JUST PROSPERITY: ACHIEVING SUSTAINABILITY WITH ENVIRONMENTAL JUSTICE 8 (1993); Evan J. Ringquist, *Assessing Evidence of Environmental Inequities: A Meta-Analysis*, 24 J. POL'Y ANALYSIS & MGMT. 223, 223–47 (2005).

⁷² Douglas L. Anderton et al., *Environmental Equity: The Demographics of Dumping*, 31 DEMOGRAPHY 229, 235–36 (1994) (finding education and occupation to be significant indicators of waste facilities in a region, but not race); John Michael Oakes et al., *A Longitudinal Analysis of Environmental Equity in Communities with Hazardous Waste Facilities*, 25 SOC. SCI. RES. 125, 133–34 (1996); Pamela Davidson & Douglas L. Anderton, *The Demographics of Dumping II: Survey of the Distribution of Hazardous Materials Handlers*, 37 DEMOGRAPHY 461, 462–63 (2000); Ringquist, *supra* note 71.

research employed methods that failed to adequately account for where people live in relation to hazardous sites.⁷³ If it is true that a disproportionate number of people of color and poor people live near environmental hazards, then failure to adequately match the location of where people live and where environmentally hazardous sites are located will lead to an underestimation of these disparities.

In this section, we describe advances in environmental justice research that better determine where people live in relation to where hazardous sites are located than do earlier, more traditional methods. We show that by better matching the locations of people and hazardous sites, racial and socioeconomic disparities around the nation's hazardous waste facilities are found to be far greater than what previous studies have shown. The differences are even greater than those reported in *Toxic Wastes and Race*.

The traditional method of conducting environmental justice analyses is to use census data to look at the racial and socioeconomic characteristics of people living inside geographic units, such as zip code areas and census tracts, containing or "hosting" hazardous sites, and then compare these against the racial and socioeconomic characteristics of the geographic units not containing or hosting the sites. In making this comparison, researchers have tended to assume that people living in the host units are located closer to the hazardous sites under investigation than those living in the non-host units. However, this is not necessarily true. First, the hazardous sites may be near the boundary of the host units, and hence the area and populations of neighboring units may be as close to the sites as those of the hosts. Note the proximity of adjacent units west and south of the unit containing a commercial hazardous waste facility in Figure 1A. Hazardous waste facilities and other potential environmental hazards located near the boundaries of their host units are not rare. Mohai and Saha, for example, found that almost 50% of commercial hazardous waste facilities are located within a quarter mile of their host tract boundaries while more than 70% are located within a half mile.⁷⁴

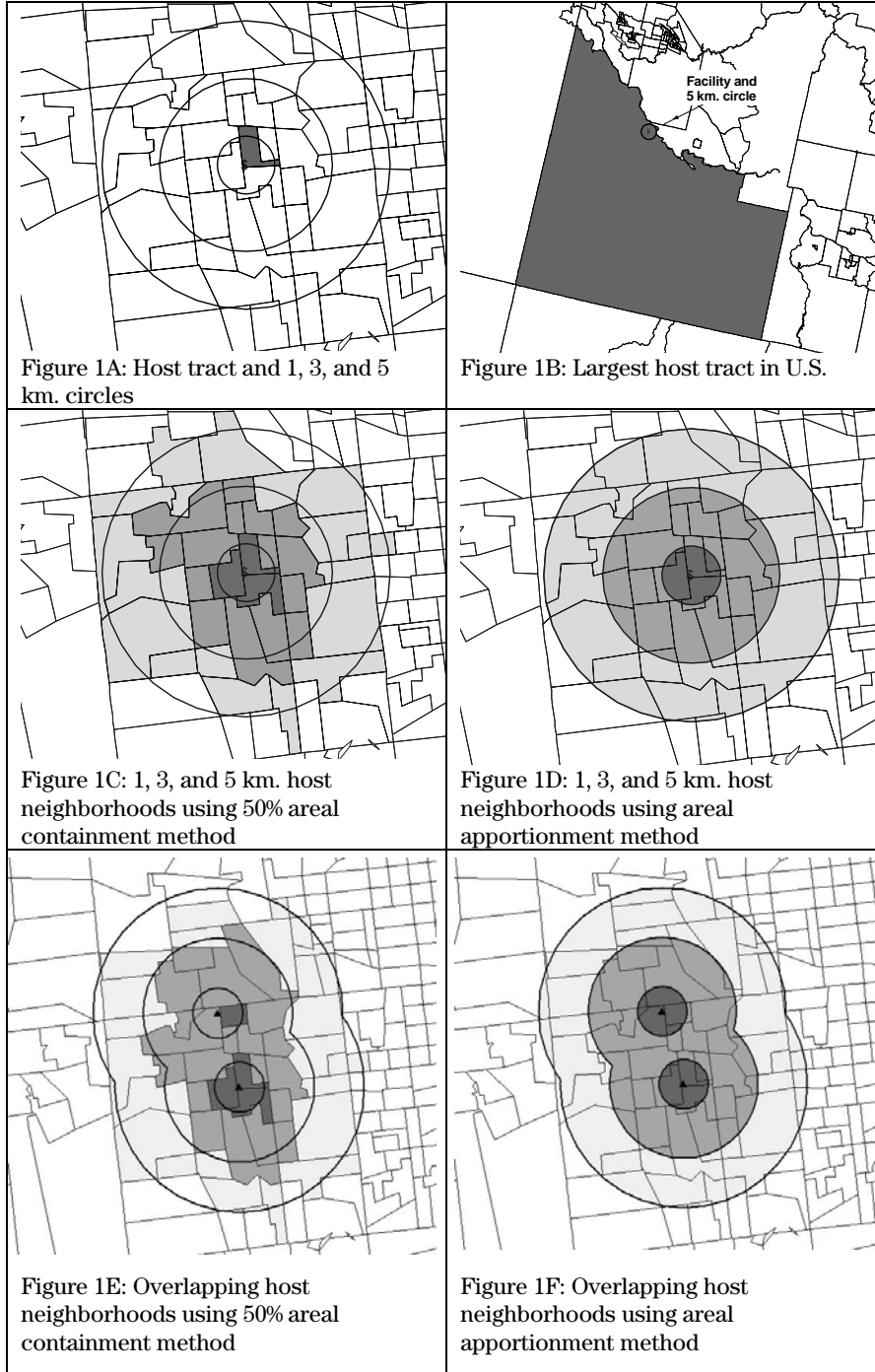
Second, there is a great deal of variation in the size of the geographic units typically used in environmental justice analyses. Depending on size, not all the units do an equally good job of controlling for the proximity between hazardous sites and nearby residential populations. Again as an illustration, Mohai and Saha found that the smallest census tract containing a commercial hazardous waste facility is less than one-tenth of a square mile, while the largest is over 7500 square miles, with all sizes in between.⁷⁵ When a host unit is small, such as the tract that is only one-tenth of a square mile, then anyone living in it will necessarily live close to the facility. However, if a host unit is large, such as the tract that is over 7500 square miles in area, most people in it likely live quite far from the facility, especially if the facility is located on the tract's boundary, as it is in Figure 1B.

⁷³ Paul Mohai & Robin Saha, *Reassessing Racial and Socioeconomic Disparities in Environmental Justice Research*, 43 DEMOGRAPHY 383, 383-99 (2006).

⁷⁴ *Id.* at 384.

⁷⁵ *Id.* at 390.

Figure 1: Comparing Methods of Matching Where People and Hazardous Waste Facilities Are Located



As environmental justice research efforts have progressed, newer methods have been introduced that do a better job of matching where people live with where environmental hazards are located. Mohai and Saha have referred to these methods as “distanced-based” methods.⁷⁶ Earlier research did not determine precise geographic locations, just that the environmental hazard and geographic unit were “coincident” (thus the term “unit-hazard coincidence method” has been used to refer to this method). In applying distance-based methods, however, the precise geographic locations of the environmental hazards are determined. Once the precise geographic location of the hazard is known, all geographic units within a specified distance of the hazard—not just the host unit—are combined to form the host neighborhood around the hazard. The racial and socioeconomic characteristics of the host neighborhood are then compared against the characteristics of areas outside the neighborhood.

Figures 1C and 1D provide illustrations of neighborhoods around the hazardous waste facility that are at distances of 1.0, 3.0, and 5.0 kilometers (0.6, 1.8, and 3.1 miles, respectively) from the facility. Note in these figures that not all the neighboring units (in this case census tracts) fit neatly within the specified distances. Some neighboring units may be only partially inside the distance. Should the partially “captured” unit be considered a part of the host neighborhood? If most of the unit—say 90% of it—is within the specified distance, the decision to include it is probably a reasonable one. However, what if only 10% of the unit is captured? Figures 1C and 1D illustrate the results of applying two different rules or methods for making this decision. These have been referred to as the “50% areal containment” and “areal apportionment” methods.⁷⁷

In applying the 50% areal containment method, any unit with at least 50% of its area within the specified distance of the hazard is considered to be part of the host neighborhood. The result is a roughly circular neighborhood as illustrated in Figure 1C. In applying the areal apportionment method, every unit that is at least partially inside the specified distance, no matter how little is captured, is given some weight in constructing the host neighborhood. Specifically, a portion of the unit’s population is used to estimate the population characteristics within the distance. This portion is based on the proportion of the unit’s area that lies inside the distance. For example, if 20% of the area of a unit is captured, then 20% of its population is used. If 90% of the area is captured, then 90% of the unit’s population is used, and so on. The sum, or aggregate, of these populations is then used to determine the population characteristics within perfectly circular neighborhoods within the specified distances, as illustrated in Figure 1D. If the hazardous sites “cluster”—are so close to each other that their respective neighborhood boundaries overlap—the respective boundaries can be merged such as in Figures 1E and 1F.

⁷⁶ *Id.* at 386–87.

⁷⁷ *Id.* at 387–89.

Distance-based methods have proven robust.⁷⁸ In other words, both 50% areal containment and areal apportionment methods lead to similar estimates about the racial and socioeconomic characteristics of the neighborhoods within specific distances of the nation's hazardous waste facilities. The use of different building block units to construct the neighborhoods—census tracts, zip code areas, or other geographic units such as census block groups—also leads to similar estimates of the characteristics of these neighborhoods.

Commercial hazardous waste treatment, storage, and disposal facilities (TSDFs) analyzed in this section and the next were identified from information provided in 1) the U.S. Environmental Protection Agency's Biennial Reporting System (BRS),⁷⁹ 2) EPA's Resource Conservation and Recovery Information System (RCRIS),⁸⁰ 3) EPA's Envirofacts Data Warehouse,⁸¹ and 4) the Environmental Services Directory (EDS).⁸² These databases were cross-checked and used to identify commercial hazardous waste TSDFs receiving waste from off-site operating in the U.S. at the time data for the 2000 Census was collected in 1999.⁸³ All together, 413 facilities were identified.⁸⁴ The status of the facilities, their addresses and precise geographic locations, determined by Geographic Information Systems' (GIS) geocoding procedures, were verified by contacting the companies. Using census tracts as the building block units, GIS also was used to construct circular neighborhoods within 1.0, 2.0, and 3.0 kilometers of the facilities by applying the 50% areal

⁷⁸ Paul Mohai & Robin Saha, *Racial Inequality in the Distribution of Hazardous Waste: A National-Level Reassessment*, 54 SOC. PROBS. 343, 343–70 (2007).

⁷⁹ U.S. ENVT'L PROT. AGENCY, NATIONAL BIENNIAL RCRA HAZARDOUS WASTE REPORT (BASED ON 2001 DATA) 1-4, 1-7, 2-4, 3-4, 3-8 (2003), available at <http://www.epa.gov/epaoswer/hazwaste/data/brs01/national.pdf>.

⁸⁰ U.S. Census Bureau, Introducing LandView III, <http://www.census.gov/apspd/pp98/pp.html> (last visited Apr. 13, 2008). LandView III is a software program that creates maps based on 1990 demographic data from the U.S. Census Bureau and EPA data on hazardous waste sites from the Resource Conservation and Recovery Information System (RCRIS). *Id.* LandView III is available for purchase from the U.S. Census Bureau. For more information, see <http://www.census.gov/apspd/pp98/pp.html>.

⁸¹ U.S. Env'tl Prot. Agency, Envirofacts Data Warehouse, <http://www.epa.gov/enviro/html/technical.html> (last visited Apr. 13, 2008). Envirofacts is an on-line database available to authorized users. The authors accessed data covering approximately the time period March 2001 to June 2002.

⁸² Environmental Information Limited, Environmental Services Directory, <http://www.envirobiz.com/newSearch/EnvSerDir.asp> (last visited Apr. 13, 2008). This is an on-line data service available to paid subscribers. The authors used data from this service for the 2001 to 2002 timeframe.

⁸³ TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 50, 68 (containing a more detailed description of the methods used to identify and map facilities). The databases pertaining to hazardous waste facilities used in this Article were created at the University of Michigan's School of Natural Resources and Environment between 2001 and 2004 through grants from the Sociology Program and Geography and Regional Science Program of the National Science Foundation (#0099123). The opinions, findings, conclusions, and recommendations expressed in this Article, however, are those of the authors and do not necessarily reflect the views of the NSF.

⁸⁴ TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 41.

containment and areal apportionment methods. The demographic characteristics of these neighborhoods were determined using 1990 census data.⁸⁵ The 1990 census data were used in order to better compare the results of using distance-based methods with those using the more traditional unit-hazard coincidence method since most of the earlier studies relied on the 1990 census. The percentages of people of color and those of low socioeconomic status were found to be greater at each of the distances of 1.0, 2.0, and 3.0 kilometers using either 50% areal containment or areal apportionment methods than when using the unit-hazard coincidence method.

Figure 2: Comparing Results of Past Studies Using Unit-Hazard Coincidence Method with Results Using Distance-Based Methods (1980 and 1990 Census and 1993 Estimates)

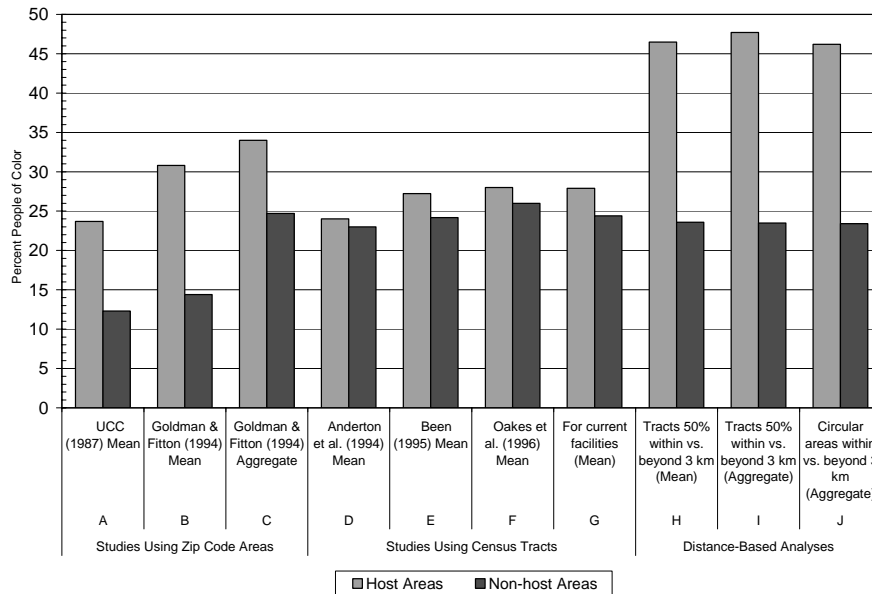


Figure 2 illustrates the outcome for people of color percentages, although similar outcomes are found for the socioeconomic variables, such as poverty rates, mean household incomes, and mean housing values. Specifically, Figure 2 compares the results of past studies that have used the unit-hazard coincidence approach (Columns A to G) with the results of using 50% areal containment and areal apportionment methods (Columns H to J). Columns A, B, and C show the results of the studies that have used zip code areas to identify the areas containing (“hosting”) or not containing hazardous waste facilities. Columns D, E, F, and G show the results of

⁸⁵ U.S. CENSUS BUREAU, 1990 CENSUS OF POPULATION AND HOUSING SUMMARY FILE 1 (TAPE) TECHNICAL DOCUMENTATION (1990), available at <http://www2.census.gov/prod2/decennial/documents/D1-D90-S100-14-TECH-01.pdf>.

studies that have used census tracts to identify host and non-host areas. Generally, studies using zip code areas have found bigger differences in the people of color percentages between host and non-host areas than the studies using census tracts. For example, the 1987 United Church of Christ study, using 1980 census data, found that the average people of color percentage in zip code areas containing a hazardous waste facility to be 23.7% compared to only 12.3% for zip code areas not containing a facility (Column A).⁸⁶

In their 1994 update to the UCC study, Benjamin Goldman and Laura Fitton used 1990 census data and found that the average people of color percentages for host and non-host zip code areas were 30.8% and 14.4%, respectively (Column B).⁸⁷ In summing (aggregating) populations in zip code areas, rather than averaging them, Goldman and Fitton found the people of color percentages in host and non-host zip code areas were 34.0% and 24.7% (Column C).⁸⁸

As mentioned, estimated disparities using the unit-hazard coincidence method have been even less when census tracts are used instead of zip code areas. For example, Anderton et al. (1994), using the 1980 census data, found average people of color percentages in host and non-host tracts of 24.0% and 23.0%, respectively (Column D).⁸⁹ Oakes et al., using 1990 census data, found these percentages to be 28.0% vs. 26.0%, respectively (Column F).⁹⁰ Both Anderton et al. and Oakes et al. omitted rural areas and some metropolitan areas from their analyses,⁹¹ and thus did not design their studies similarly to the UCC and Goldman and Fitton studies.⁹² However, even when the study designs are constructed similarly to that of the UCC, the differences in the average people of color percentages between host and non-host census tracts, although somewhat bigger, are still relatively small. For example, Been, using 1990 census data, found these to be 27.2% and 24.2%,

⁸⁶ TOXIC WASTES AND RACE, *supra* note 2, at 14.

⁸⁷ TOXIC WASTES AND RACE REVISITED, *supra* note 4, at 1, 5.

⁸⁸ *Id.* at 8–9.

⁸⁹ Anderton et al., *supra* note 72, at 235.

⁹⁰ Oakes et al., *supra* note 72, at 133. Neither Oakes et al. nor Anderton et al. presented overall people of color percentages, as the United Church of Christ, Goldman and Fitton, and Been studies did. *Id.*; Anderton et al., *supra* note 72, at 235; TOXIC WASTES AND RACE, *supra* note 2, at 14; TOXIC WASTES AND RACE REVISITED, *supra* note 4, at 5, 8–9; Vicki Been, *Analyzing Evidence of Environmental Justice*, 11 J. LAND USE & ENVTL. L. 1, 22 (1995). Instead, they presented percentages for African Americans and Latinos separately. In order to more easily compare the results of the two former studies with those of the latter, the African American and Hispanic percentages were summed to produce an overall people of color percentage. *See also* Paul Mohai, *The Demographics of Dumping Revisited: Examining the Impact of Alternate Methodologies in Environmental Justice Research*, 14 VA. ENVTL. L.J. 615, 621–23 (1995). Mohai points out that such summing is a reasonable approximation of the overall people of color percentages in the U.S. because the proportion of racial and ethnic groups other than African Americans and Latinos is in comparison small. *Id.* at 623. The overlap between the African American and Latino percentages is likewise very small. For example, in the 1980 census African Americans and Latinos made up 97.7% of all racial and ethnic minorities while the overlap between these two categories was less than 1.0%. *Id.* at 621–23.

⁹¹ Oakes et al., *supra* note 72, at 130.

⁹² *Id.* at 128.

respectively (Column E),⁹³ while applying the unit-hazard coincidence method and 1990 census to the current universe of 413 hazardous waste facilities leads to similar results of 27.9% and 24.4% (Column G).

The newer, distance-based methods, which better match where people and environmentally hazardous sites are located, reveal much larger racial disparities in the distribution of hazardous waste facilities. Columns H, I, and J display the people of color percentages within and beyond three kilometers of the nation's hazardous waste TSDFs using 50% areal containment and areal apportionment methods. Column H shows differences in the people of color percentages applying the 50% areal containment method in which percentages for census tracts have been averaged. Column I also shows differences in the people of color percentages applying the 50% areal containment method, but in which the populations of the tracts have first been aggregated (summed). Column J shows differences in the people of color percentages applying the areal apportionment method, and, here also, the percentages are for the aggregate populations within and beyond the three-kilometer distances.

As can be seen, regardless of which distance-based method is applied and regardless of whether populations are averaged or summed, the proportion of people of color estimated to be within three kilometers of a hazardous waste facility is between 46% and 48%, while the proportion of people of color estimated to be beyond this distance is between 23% and 24%. Thus, both the concentration of people of color around the nation's hazardous waste facilities (about 46%) and disparities between host and non-host areas (over 20%) are far greater when distance-based (Columns H to J), as opposed to unit-hazard coincidence (Columns A to G) methods are applied.

In sum, newer methods that better match where people and environmental hazards are located indicate that such disparities are even greater than what the previous studies have shown. Given the attention to environmental injustice fueled by the evidence of the 1987 *Toxic Wastes and Race* and other prior studies, a finding that racial and socioeconomic disparities around hazardous sites are even greater than previously reported when these methods are applied underscores the urgency of finding solutions to this problem. In the next section, the newer methods are applied to the most recent data on hazardous waste facility location and the 2000 census to make a more detailed and updated assessment of the current extent of racial and socioeconomic disparities in the distribution of the nation's hazardous waste facilities.

VI. ASSESSMENT OF CURRENT DISPARITIES

In 2001, industry in the United States generated approximately 41 million tons of hazardous wastes.⁹⁴ Under the Resource Conservation and

⁹³ Been, *supra* note 90, at 1-36.

⁹⁴ U.S. ENVTL. PROT. AGENCY, *supra* note 79, at 1-1 (2003).

Recovery Act of 1976 (RCRA),⁹⁵ hazardous wastes must be managed by specially designed facilities referred to as treatment, storage, and disposal facilities (TSDFs).⁹⁶ Companies operating such facilities are required to obtain permits from state and sometimes federal environmental agencies and conform to local land use regulations. However, as the November 2006 explosion of stored hazardous wastes in Danvers, Massachusetts illustrates, TSDFs can adversely impact nearby residents even when operated according to accepted specifications.⁹⁷ The city of East Palo Alto was home to Romco Environmental Technologies, a commercial facility that had endangered workers and the surrounding community by operating with only a provisional permit and releasing large amounts of hazardous air pollutants into the environment.⁹⁸ Indeed, hazardous waste facilities are well known as serious risks to health, property, and quality of life.⁹⁹ As a result of these threats, public opposition to siting of TSDFs is nearly universal, especially for high-profile facilities such as incinerators and landfills, and new facility sitings have tended to follow the path of least political resistance.¹⁰⁰

⁹⁵ Resource Conservation and Recovery Act of 1976, 42 U.S.C. §§ 6901–6992k (2000) (amending Solid Waste Disposal Act, Pub. L. No. 89-272, 79 Stat. 992).

⁹⁶ *Id.* § 6922(a)(5) (2000).

⁹⁷ Beth Daley, *Oversight Gap Cited on Waste at Danvers Site*, BOSTON GLOBE, Nov. 29, 2006, http://www.boston.com/news/local/articles/2006/11/29/oversight_gap_cited_on_waste_at_danvers_site/ (last visited Apr. 13, 2008) (revealing that “[e]nvironmental regulators never inspected hazardous materials storage practices” at the Danvers chemical plant). The explosion in Danvers damaged over 60 buildings, displaced 300 to 400 people, and rendered 15 to 25 houses uninhabitable. Andrew Ryan, *Firefighters Use Foam at Blast Site, Described as a ‘War Zone’*, BOSTON GLOBE, Nov. 22, 2006, http://www.boston.com/news/globe/city_region/breaking_news/2006/11/firefighters_to.html (last visited Apr. 13, 2008).

⁹⁸ See Raj Jayadev, *Silicon Valley’s Dirty Secret*, METROACTIVE, Jan. 3–9, 2007, <http://www.metroactive.com/metro/01.03.07/environmental-racism-0701.html> (last visited Apr. 13, 2008) (providing an overview of the chemical leaks, accidents, and explosions at the plant); Suzanne Bohan, *State Orders Romco Closed*, PALO ALTO DAILY NEWS, Aug. 31, 2007, <http://www.paloaltonews.com/article/2007-8-31-epa-romco> (last visited Apr. 13, 2008) (reporting that citizen protests and a long record of fines and penalties for numerous violations have resulted in the California Department of Toxic Substances Control ordering the closure this facility).

⁹⁹ Numerous studies document adverse health and property value impacts of hazardous waste facilities on surrounding neighborhoods. See, e.g., Akerke Baibergenova et al., *Low Birth Weight and Residential Proximity to PCB-Contaminated Waste Sites*, 111 ENVTL. HEALTH PERSP. 1352 (2003); H. Dolk et al., *Risk of Congenital Anomalies Near Hazardous-Waste Landfill Sites in Europe: The EUROHAZCON Study*, 352 LANCET 423 (1998); H.M.P. Fielder et al., *Assessment of Impact on Health of Residents Living Near the Nant-y-Gwyddon Landfill Site: Retrospective Analysis*, 320 BRIT. MED. J. 19 (2000); Sandra A. Gerschwind et al., *Risk of Congenital Malformations Associated with Proximity to Hazardous Waste Sites*, 135 AM. J. EPIDEMIOLOGY 1197 (1992); Arthur C. Nelson et al., *Price Effects and Landfills on House Values*, 68 LAND ECON. 359 (1992); M. Vrijheid et al., *Hazard Potential Ranking of Hazardous Waste Landfill Sites and Risk of Congenital Anomalies*, 59 J. OCCUPATIONAL & ENVTL. MED. 768 (2002). Perceptions of risk, and thus quality of life impacts, related to waste sites have also been variously noted. See, e.g., MICHAEL R. EDELSTEIN, CONTAMINATED COMMUNITIES: COPING WITH RESIDENTIAL TOXIC EXPOSURE 65–78 (2d ed. 2004); Susan J. Elliott et al., *Modeling Psychosocial Effects of Exposure to Solid Waste Facilities*, 37 SOC. SCI. & MED. 791 (1993). See also Saha & Mohai, *supra* note 7, at 625–28 (providing a review of environmental justice empirical studies).

¹⁰⁰ Robert D. Bullard & Beverly Hendrix Wright, *Blacks and the Environment*, 14 HUMBOLDT

Although in recent decades communities of color have begun to mount their own resistance, their limited scientific, technical, and legal resources have historically made such communities vulnerable to facility sitings.¹⁰¹

This section employs the same methods and database of 413 commercial hazardous waste facilities as the previous section, but utilizes 2000 census data instead of 1990 data to assess the current extent of racial and socioeconomic disparities for the nation as a whole. In addition, disparities are examined by state, which allows us to determine whether national trends are the result of contributions from particular parts of the country and to detect environmental justice “hot spots,” i.e., areas with high concentrations of TSDFs and large racial or socioeconomic disparities. In addition to providing an analysis of metropolitan areas, where most hazardous waste facilities are located, we examine whether disparities are greater for host neighborhoods where multiple facilities are clustered and where risks are therefore also likely to be concentrated.¹⁰² Finally, following the example of many other environmental justice empirical analyses, we conclude the assessment using 2000 census data with a multivariate analysis of the importance of race as a predictor of facility locations in comparison to socioeconomic status and other non-racial factors. We thereby determine if race still matters twenty years after the publication of *Toxic Wastes and Race in the United States*.

The approach used to assess racial and socioeconomic disparities employed is to compare the demographic characteristic of populations living within three kilometers (approximately 1.8 miles) of a TSDF nationally, by state and so forth to the demographic characteristics in corresponding areas without facilities, i.e., areas beyond three kilometers of a TSDF.¹⁰³ Three kilometers corresponds to the distance within which empirical studies have noted adverse health, property value, and quality of life impacts associated with hazardous waste sites, including hazardous waste facilities.¹⁰⁴ This

J. SOC. REL. 165, 171 (1987); Saha & Mohai, *supra* note 7, at 639.

¹⁰¹ Robert D. Bullard, *Solid Waste Sites and the Black Houston Community*, 53 SOC. INQUIRY 273, 285 (1983); BULLARD, *supra* note 1, at 1–5; Dorceta E. Taylor, *Mobilizing for Environmental Justice in Communities of Color: An Emerging Profile of People of Color Environmental Groups*, in ECOSYSTEM MANAGEMENT: ADAPTIVE STRATEGIES FOR NATURAL RESOURCES ORGANIZATIONS IN THE 21ST CENTURY 33, 51–55 (Jennifer Aley et al. eds., 1998).

¹⁰² Note that *Toxic Wastes and Race Revisited*, *supra* note 4, the 1994 update of the original United Church of Christ report, *Toxic Wastes and Race*, *supra* note 2, found that people of color were concentrated in the most environmentally hazardous communities as measured by the number of commercial hazardous waste facilities and amounts of hazardous wastes handled. TOXIC WASTES AND RACE REVISITED, *supra* note 4, at 1–2.

¹⁰³ Racial, socioeconomic, and housing characteristics of circular host neighborhoods of 1, 3, and 5 kilometer radius around the 413 facilities were examined. However, because the results were very consistent regardless of the radius, only findings pertaining to the 3 kilometer radius are reported.

¹⁰⁴ Similarly, the Superfund Hazard Ranking System defines affected populations to be those who live within 4 miles (6.4 km) of sites having groundwater contamination and/or airborne contamination within 1 mile (1.6 km) of sites having soil contamination only, and 15 miles downstream of areas where contaminants enter surface water. See U.S. ENVT'L PROT. AGENCY, HAZARD RANKING SYSTEM GUIDANCE MANUAL 117, 204, 383, 412 (1992), available at <http://www.epa.gov/superfund/sites/npl/hrsres/index.htm>. Also, note Superfund sites are

radius is also in line with those used in other environmental justice studies employing distance-based methods.¹⁰⁵ The areal apportionment method and 2000 census tracts were used to estimate the demographic characteristics. Following the approach of the preceding analysis of 1990 data, areas within three kilometers of a TSDF are referred to as “host neighborhoods” and areas beyond three kilometers are referred to as “non-host areas.” People of color percentages as a whole are reported along with population percentages of individual racial and ethnic groups.¹⁰⁶ Socioeconomic status indicators used include poverty rates, mean household incomes, percentage of persons twenty-five years old and over with a four-year college degree, and the percentage of persons sixteen years old and over employed in “white collar” and “blue collar” occupations.¹⁰⁷ If people of color percentages are higher in host neighborhoods than in the non-host comparison areas, then a racial disparity is therefore said to exist. Likewise, socioeconomic disparities exist if poverty rates are higher, or mean household incomes and housing values are lower, in host neighborhoods than in the non-host areas. These disparities are consistent with an environmental justice claim.

Two primary approaches are used to assess the magnitude of racial and socioeconomic disparities: 1) differences in values (percentages of people of color, poverty rates, mean household income, mean housing values, etc.) between host neighborhoods and non-host areas; and 2) ratios of host neighborhood values to non-host area values. For example, if Hispanic or Latino percentages were 25% and 10%, respectively, the difference would be 15% and the ratio would be 2.5. The results of tests are also reported to establish if these disparities are statistically significant and to assess the importance of race in predicting facility locations.

Toxic Wastes and Race Revisited, the 1994 update of the original UCC report, *Toxic Wastes and Race in the United States*, showed that racial and socioeconomic disparities associated with the location of the nation’s

associated with hazardous wastes releases into the environment. Though TSDFs may legally release small amounts into the environment, they are designed to prevent releases harmful to human health and the environment. See U.S. Env’t Prot. Agency, *Treatment, Storage and Disposal of Hazardous Waste*, <http://www.epa.gov/epaoswer/osw/tsds.htm> (last visited Apr. 13, 2008) (discussing general requirements and regulations for TSDFs). Because of poor environmental compliance, some TSDFs may nevertheless end up on the Superfund list of contaminated sites. For a more complete discussion of proximity and risk, see Mohai & Saha, *supra* note 73.

¹⁰⁵ See, e.g., TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 52.

¹⁰⁶ Specific people of color groups examined include African Americans, Hispanics or Latinos, Asians/Pacific Islanders, and American Indians/Alaskan Natives. Note that the U.S. Census Bureau defines Hispanic as an ethnic, not a racial category. See ELIZABETH M. GRIECO & RACHEL C. CASSIDY, U.S. CENSUS BUREAU, OVERVIEW OF RACE AND HISPANIC ORIGIN: CENSUS 2000 BRIEF 1-2 (2001), available at <http://www.census.gov/prod/2001pubs/c2kbr01-1.pdf>. Hispanics can belong to any of the recognized races, including the white category. However, for convenience, disparities in percentages of Hispanics or Latinos will be referred to as *racial* disparities.

¹⁰⁷ For a description of the construction of the racial/ethnic and socioeconomic variables and Census data sources, see TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 69–70.

hazardous waste facilities increased from 1980 to 1993.¹⁰⁸ Because the previous studies used the unit-hazard coincidence method, it is not possible to make a meaningful assessment of recent changes from the results obtained using the distance-based methods of this Article.¹⁰⁹

A. National Findings¹¹⁰

Over nine million people are estimated to live within three kilometers (1.8 miles) of the nation's 413 commercial hazardous waste facilities.¹¹¹ This represents 3.3% of the U.S. population.¹¹² More than 5.1 million people of color, including 2.5 million Hispanics or Latinos, 1.8 million African Americans, 616,000 Asians/Pacific Islanders, and 62,000 Native Americans, live in neighborhoods with one or more TSDf (see Table 1). Indeed, these host neighborhoods are densely populated, with over 870 persons per square kilometer (2300 per mi²), compared to 30 persons per square kilometer (77 per mi²) in non-host areas. Not surprisingly, 343 facilities (83%) are located in metropolitan areas.

For 2000, neighborhoods within three kilometers of a TSDf are 56% people of color whereas non-host areas are 30% people of color (see Table 1).¹¹³ Thus, percentages of people of color as a whole are 1.9 times greater in host neighborhoods than in non-host areas. Percentages of African Americans, Hispanics/Latinos, and Asians/Pacific Islanders in host neighborhoods are 1.7, 2.3, and 1.8 times greater (20% vs. 12%, 27% vs. 12%, and 6.7% vs. 3.6%), respectively.¹¹⁴

Table 1 also reveals significant socioeconomic disparities. Poverty rates in the host neighborhoods are 1.5 times greater than those in non-host areas (18% vs. 12%) and mean annual household incomes in host neighborhoods are 15% lower (\$48,234 vs. \$56,912). Mean owner-occupied housing values are also disproportionately low in TSDf host neighborhoods. These data reveal depressed economic conditions in host neighborhoods of the nation's hazardous waste facilities. Education and employment disparities also can be noted in Table 1. The percentage of persons twenty-five years and over with a four-year college degree are much lower in host neighborhoods than

¹⁰⁸ TOXIC WASTES AND RACE REVISITED, *supra* note 4, at 2. The 1993 findings used estimates based on 1990 Census data.

¹⁰⁹ However, using the same universe of 413 TSDfs and the areal apportionment method, no significant change in the magnitude of racial and socioeconomic disparities occurred between 1990 and 2000. See TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 53–54.

¹¹⁰ Findings reported are generally aggregate values for all host neighborhoods (i.e., neighborhoods within 3 kilometers of a facility), not averages of each host neighborhood and the census tracts comprising them. *Id.* at 51.

¹¹¹ *Id.* at 52.

¹¹² *Id.*

¹¹³ *Id.* at 53. Note that 147 of the 413 host neighborhoods (36%) have a majority of people of color.

¹¹⁴ However, percentages of American Indians/Alaskan Natives (hereinafter referred to as Native Americans) in host neighborhoods and non-host areas are very small and roughly equal (0.7% vs. 0.9%).

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in non-host areas (18% vs. 25%, respectively). Similar disparities exist for the percentage of persons employed in professional “white collar” occupations, while percentages employed in “blue collar” occupations are disproportionately high in host neighborhoods.¹¹⁵ These racial and socioeconomic disparities are statistically significant ($p < 0.001$).

Table 1: Racial and Socioeconomic Disparities for the Nation’s 413 TSDFs
(2000 Census)

	Host Neighborhoods	Non-Host Areas	Difference	Ratio
Population				
Total Population (1000s)	9,222	272,200	-262,979	0.03
Population Density (persons/sq. km.)	870	29.7	840	29.0
Race/Ethnicity				
% People of Color	55.9%	30.0%	25.9%	1.86
% African American	20.0%	11.9%	8.0%	1.67
% Hispanic or Latino	27.0%	12.0%	15.0%	2.25
% Asian/Pacific Islander	6.7%	3.6%	3.0%	1.83
% Native American	0.7%	0.9%	-0.2%	0.77
Socioeconomics				
Poverty Rate	18.3%	12.2%	6.1%	1.50
Mean Household Income	\$48,234	\$56,912	-\$8,678	0.85
Mean Owner-Occpd. Housing Value	\$135,510	\$159,536	-\$24,025	0.85
% with 4-Year College Degree	18.5%	24.6%	-6.1%	0.75
% Professional “White Collar” Occp.	28.0%	33.8%	-5.8%	0.83
% Employed in “Blue Collar” Occp.	27.7%	24.0%	3.7%	1.15

NOTES: Data computed using areal apportionment method (see Figure 1D). Differences and ratios are between host neighborhood and non-host area. Differences may not precisely correspond to other values due to rounding off.

¹¹⁵ The definition of “white collar” and “blue collar” occupations derives from 1990 and 2000 Census data. However, due to differences between methodology and occupation definitions in the 1990 and 2000 Censuses, these figures are not directly comparable. See TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 69 (discussing methods used to group occupations into “white collar” and “blue collar” designations).

Table 2 shows that neighborhoods with clustered facilities, i.e., multiple facilities, have higher percentages of people of color than those with non-clustered facilities, i.e., a single facility (69% vs. 51%).¹¹⁶ In addition, percentages of African Americans and Hispanics in the neighborhoods with clustered facilities are significantly higher than neighborhoods with non-clustered facilities (29% vs. 16% and 33% vs. 25%, respectively). Although Asians/Pacific Islanders are disproportionately located in all host neighborhoods (see Table 2), they are found in lower percentages in the neighborhoods with clustered facilities than in non-clustered facility neighborhoods (4.3% vs. 7.8%). Native American percentages are very small and nearly equal (0.7%) in clustered and non-clustered facility host neighborhoods.¹¹⁷

Poverty rates¹¹⁸ in the neighborhoods with clustered facilities are high compared to non-clustered facility neighborhoods (22% vs. 17%), mean household incomes are 10% lower in neighborhoods with clustered facilities (\$44,600 vs. \$49,600), and mean housing values are 14% lower (\$121,200 vs. \$141,000). All of these racial and socioeconomic disparities between neighborhoods with clustered facilities and non-clustered facility host neighborhoods are statistically significant ($p < 0.01$). These findings are similar to those of the 1987 *Toxic Wastes and Race* report and the 1994 *Toxic Wastes and Race Revisited* update, both of which found that zip codes with higher levels of hazardous waste activity were home to higher percentages of people of color and had higher poverty rates.¹¹⁹ In 2000, people of color and the poor thus continue to be particularly vulnerable to

¹¹⁶ A total of 49 clustered facility neighborhoods (42 with 2 facilities, 5 with 3 facilities, 1 with 4 facilities and 1 with 6 facilities) and 304 non-clustered facility neighborhoods were delineated. Thus, clustered facility neighborhoods and non-clustered facility neighborhoods contain 109 and 304 facilities, respectively. Most analyses reported, however, involve the combined clustered and non-cluster facility neighborhoods. See Figures 1E and 1F for an illustration of neighborhoods with clustered facilities.

¹¹⁷ While there may be individual sites with relatively high percentages of Native Americans, any site-specific disparities that exist for Native Americans appear to be masked in this nationwide study and a site-by-site analysis is beyond the scope of this study. Because of Native Americans' small numbers relative to the other groups in this analysis, they are not included in subsequent tables. Environmental injustices in Indian Country, nevertheless, have been well-documented, and Native Americans have been an important group in the struggle for environmental justice. See, e.g., WINONA LADUKE, *ALL OUR RELATIONS: NATIVE STRUGGLES FOR LAND AND LIFE* (1999); JAMES M. GRIJALVA, *CLOSING THE CIRCLE: ENVIRONMENTAL JUSTICE IN INDIAN COUNTRY* (2008); Brett Clark, *The Indigenous Environmental Movement in the United States: Transcending Borders in Struggles Against Mining, Manufacturing, and the Capitalist State*, 15 *ORG. & ENV'T* 410 (2002); Sarah Krakoff, *Tribal Sovereignty and Environmental Justice*, in *JUSTICE AND NATURAL RESOURCES: CONCEPTS, STRATEGIES, AND APPLICATIONS* (Kathryn M. Mutz, Gary C. Bryner & Douglas S. Kenney eds., 2002); Gregory Hooks & Chad L. Smith, *The Treadmill of Destruction: National Sacrifice Areas and Native Americans*, 69 *AM. SOC. REV.* 558 (2004); Mansel G. Blackford, *Environmental Justice, Native Rights, Tourism, and Opposition to Military Control: The Case of Kaho'olawe*, 91 *J. AM. HIST.* 544 (2004).

¹¹⁸ The poverty rate is the percentage of people or families who are below the poverty line. U.S. Census Bureau, Poverty, <http://www.census.gov/hhes/www/poverty/poverty.html> (last visited Apr. 13, 2008).

¹¹⁹ *TOXIC WASTES AND RACE*, *supra* note 2, at 13; *TOXIC WASTES AND RACE REVISITED*, *supra* note 4, at 3.

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the various negative impacts of hazardous waste facilities. Moreover, the present findings show that this is the case for African Americans, Hispanics, and Asians/Pacific Islanders.

Table 2: Racial and Socioeconomic Characteristics for Clustered and Non-Clustered Facility Host Neighborhoods

	Clustered	Non-Clustered	Difference	Ratio
<i>Race/Ethnicity</i>				
% People of Color	68.8%	50.6%	18.2%	1.36
% African American	29.1%	15.9%	13.2%	1.83
% Hispanic or Latino	33.4%	24.6%	8.8%	1.36
% Asian/Pacific Islander	4.3%	7.8%	-3.5%	0.55
% Native American	0.7%	0.7%	0.0%	0.94
<i>Socioeconomics</i>				
Poverty Rate	21.6%	16.8%	4.8%	1.29
Mean Household Income	\$44,587	\$49,614	-\$5,027	0.90
Mean Housing Value	\$121,203	\$140,992	-\$19,789	0.86

B. State Disparities

Under the oversight of the EPA, nearly all states now manage their own environmental programs (such as RCRA, Clean Air Act, and Clean Water Act).¹²⁰ States also are beginning to develop environmental justice and enhanced enforcement programs of their own to reduce risks to environmentally overburdened communities.¹²¹ Thus, it is helpful to identify states where TSDFs are concentrated and where racial and socioeconomic disparities are the greatest. It is in these states where more stringent regulatory action may be warranted.

California has the greatest number of TSDFs (45) followed by Texas (33); Pennsylvania (23); Ohio (21); Michigan (19); New York (18); Illinois

¹²⁰ Nicholas Targ, *The States' Comprehensive Approach to Environmental Justice, in POWER, JUSTICE AND THE ENVIRONMENT: A CRITICAL APPRAISAL OF THE ENVIRONMENTAL JUSTICE MOVEMENT* 171-74 (David Naguib Pellow & Robert J. Brulle eds., 2005); PHILIP RUTLEDGE ET AL., NATIONAL ACADEMY OF PUBLIC ADMINISTRATION, ENVIRONMENTAL JUSTICE IN EPA PERMITTING: REDUCING POLLUTION IN HIGH-RISK COMMUNITIES IS INTEGRAL TO THE AGENCY'S MISSION 1 (2001), available at <http://www.epa.gov/Compliance/resources/publications/ej/annual-project-reports/napa-epa-permitting.pdf>.

¹²¹ Targ, *supra* note 120, at 171-74. See also David Hess & Langdon Winner, *Enhancing Justice and Sustainability at the Local Level: Affordable Policies for Urban Governments*, 12 LOCAL ENV'T 379, 384-85 (2007).

(16), Indiana (16); Missouri (15); and New Jersey (14).¹²² These ten states host 220 TSDFs in total. This constitutes a majority (53%) of the nation's commercial TSDFs.¹²³

Table 3: People of Color Percentages by State¹

State Abbr.	Number of TSDFs	Rank by Number of TSDFs	Majority People of Color Sites ²	Host Area	Non-Host Areas	Diff. ³	Ratio
AL	8	20	3	66.3%	29.3%	36.9%	2.26
AZ	7	22	4	64.3%	35.7%	28.6%	1.80
AR	5	25	2	51.6%	21.3%	30.4%	2.43
CA	45	1	38	81.2%	51.5%	29.7%	1.58
CO	5	27	1	41.0%	25.2%	15.8%	1.63
CT	4	28	1	49.0%	21.3%	27.7%	2.30
FL	13	11	5	52.7%	34.3%	18.4%	1.54
GA	12	13	7	55.6%	37.0%	18.6%	1.50
ID	2	43	0	7.9%	12.0%	-4.1%	0.66
IL	16	7	10	67.9%	30.8%	37.1%	2.21
IN	16	8	4	41.2%	13.1%	28.1%	3.14
IA	3	35	0	21.0%	7.0%	13.9%	2.98
KS	9	19	3	47.2%	15.9%	31.3%	2.97
KY	9	18	1	51.5%	10.0%	41.5%	5.14
LA	12	14	5	52.7%	37.3%	15.4%	1.41
ME	2	40	0	7.8%	3.4%	4.4%	2.31
MD	3	31	1	44.8%	37.8%	7.0%	1.19
MA	12	12	1	33.5%	17.2%	16.3%	1.95
MI	19	5	8	65.7%	19.2%	46.5%	3.43
MN	10	16	2	34.4%	10.3%	24.1%	3.33
MS	3	32	2	50.6%	39.1%	11.5%	1.29
MO	15	9	2	28.3%	15.9%	12.4%	1.78
NE	5	26	0	11.2%	12.7%	-1.4%	0.89
NV	3	37	1	79.4%	33.1%	46.3%	2.40
NJ	14	10	3	54.8%	33.0%	21.9%	1.66
NM	3	34	1	52.5%	55.4%	-2.9%	0.95
NY	18	6	2	50.3%	37.3%	13.0%	1.35
NC	10	15	4	55.9%	29.4%	26.5%	1.90
ND	3	36	0	7.5%	8.2%	-0.7%	0.91
OH	21	4	4	39.0%	15.3%	23.7%	2.55
OK	8	21	0	28.1%	25.9%	2.2%	1.09
OR	3	38	0	25.7%	16.3%	9.4%	1.57
PA	23	3	0	16.5%	15.9%	0.6%	1.04

¹²² TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 74.

¹²³ *Id.*

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RI	3	30	1	39.6%	14.6%	25.0%	2.71
SC	4	29	3	43.9%	33.8%	10.2%	1.30
SD	1	44	0	13.7%	11.9%	1.8%	1.15
TN	6	23	3	53.8%	20.4%	33.4%	2.64
TX	33	2	20	66.4%	47.1%	19.4%	1.41
UT	6	24	4	36.5%	14.1%	22.4%	2.58
VT	2	41	0	4.4%	3.9%	0.5%	1.13
VA	9	17	0	36.1%	29.8%	6.3%	1.21
WA	3	39	1	52.8%	20.7%	32.0%	2.54
WV	2	42	0	10.2%	5.4%	4.8%	1.89
WI	3	33	0	35.6%	12.4%	23.2%	2.87

¹ Alaska, Delaware, Hawaii, New Hampshire, Montana, and Wyoming have no commercial TSDFs.

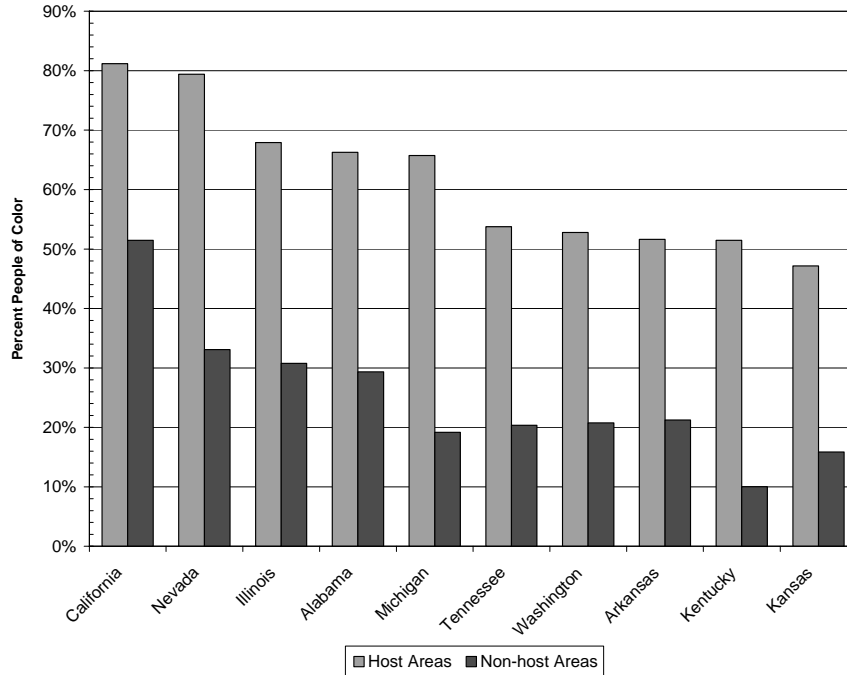
² Number of host neighborhoods with majority people of color, i.e., greater than 50%.

³ Differences may not precisely correspond to other values due to rounding off.

Of the forty-four states with commercial TSDFs, forty of them (90%) have disproportionately high percentages of people of color in host neighborhoods—on average about two times greater than the average percentage of non-host areas for those states (44% vs. 23%).¹²⁴ As shown in Table 3, host neighborhoods in nineteen states are majority people of color. Figure 3 shows states with the ten largest differences in people of color percentages between host neighborhoods and non-host areas. These states are shown in order (left-to-right) by the largest percentages of people of color living in the host neighborhoods. For both California and Nevada, these percentages are about 80%. For three additional states, people of color make up a two-thirds or more majority in these neighborhoods. In descending order by the size of the differences between host and non-host areas, these states are: Michigan (66% vs. 19%), Nevada (79% vs. 33%), Kentucky (51% vs. 10%), Illinois (68% vs. 31%), Alabama (66% vs. 31%), Tennessee (54% vs. 20%), Washington (53% vs. 20%), Kansas (47% vs. 16%), Arkansas (52% vs. 21%), and California (81% vs. 51%). Differences in these percentages range from a high of 47% for Michigan to 30% for California.

¹²⁴ Alaska, Delaware, Hawaii, New Hampshire, Montana, Wyoming, and the District of Columbia did not have licensed and operating TSDFs in 1999. TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 58. States without racial disparities include North Dakota, Nebraska, New Mexico, and Idaho. *Id.* at 74.

Figure 3: States with the 10 Largest Differences in People of Color Percentages between Host Neighborhoods and Non-Host Areas



Numerous other states have large disparities in people of color percentages. Many of these states, including Arizona, Florida, Georgia, Louisiana, New Jersey, New York, North Carolina, and Texas, have majority people of color host neighborhoods (see Table 3). People of color disparities are statistically significant ($p < 0.05$) for thirty-two states, including all the aforementioned states. Host neighborhoods in an overwhelming majority of the forty-four states with commercial hazardous waste facilities have disproportionately high percentages of Hispanics (35 states), African Americans (38 states), and Asians/Pacific Islanders (27 states). Among these states, the average disparity between host neighborhoods and non-host areas is 17% vs. 9.0% for Hispanics, 24% vs. 11% for African Americans, and 4.5% vs. 2.2% for Asians/Pacific Islanders.¹²⁵

Thirty-five states have socioeconomic disparities as indicated by poverty rates. For these states, the average poverty rate in host neighborhoods is 18% compared to 12% in non-host areas. States with very large poverty rate disparities include Arizona, Connecticut, Michigan, Minnesota, Nevada, and Ohio. In these states, poverty rates in host neighborhoods are more than two times greater than those in non-host

¹²⁵ Disparities in Hispanic percentages are statistically significant ($p < 0.05$) for 21 states. Disparities in African American and Asian/Pacific Islander percentages are statistically significant for 25 and 11 states, respectively. For statewide descriptive statistics by racial/ethnic group, see TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 75–77.

areas.¹²⁶ Poverty rate disparities are statistically significant ($p < 0.05$) for a majority of states with commercial hazardous waste facilities (23 out of 44).

This analysis shows that statistically significant racial and socioeconomic disparities in TSDf locations are very prevalent among the states with TSDf's throughout the country. This analysis of the states also shows that racial disparities are more prevalent and extensive than socioeconomic disparities. Although this suggests that race has more to do with the current distribution of the nation's hazardous waste facilities than poverty, relative importance of race and socioeconomic status is more intensively analyzed below.

C. Metropolitan Area Disparities

The state-wide disparities may in part reflect the fact that most commercial hazardous waste facilities are located in large cities where people of color are generally found in relatively high percentages. Various scholars have suggested examining host neighborhoods in metropolitan areas by themselves to avoid possible confounding effects of counting rural areas, which have relatively low percentages of people of color, among the non-host areas.¹²⁷ Such a comparison is more conservative since the likelihood of finding disparities is reduced.

In 2000, 149 of the nation's 331 metropolitan areas (45%) contained 343 of the nation's 413 commercial hazardous waste facilities (87%).¹²⁸ More than nine million people reside in host neighborhoods of facilities located in metropolitan areas. This represents 98% of the total population living in host neighborhoods of all 413 facilities.¹²⁹

Table 4 compares the racial and socioeconomic characteristics of the metropolitan host neighborhoods to the characteristics of non-host areas. In this comparison, non-host areas include areas in all 331 U.S. metropolitan areas (MAs) that lie beyond the three-kilometer circular host neighborhoods. In metropolitan areas, people of color percentages in host neighborhoods are significantly greater than those in non-host areas (57% vs. 33%). Likewise, the nation's metropolitan areas show disparities in percentages of African Americans, Hispanics and Asians/Pacific Islanders, 20% vs. 13%, 27%

¹²⁶ For descriptive statistics of poverty rates for the states, see TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 78.

¹²⁷ See generally Anderton et al., *supra* note 72 (using census tract data to investigate environmental equity in the demographics of dumping); Mohai, *supra* note 90, at 648 (examining two studies that used different units for investigating possible disparities).

Metropolitan Areas (MAs) are prescribed by the Office of Budget and Management (OMB) to gather statistics and allocate resources to various federal programs. They are not political jurisdictions like incorporated towns, cities and counties. A single metropolitan area may encompass several counties and cities, which in turn may be located in adjoining states.

TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 60.

¹²⁸ TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 60.

¹²⁹ *Id.*

vs. 14%, and 6.8% vs. 4.4%, respectively. Table 4 also shows socioeconomic disparities between host neighborhoods and non-host areas, for example, in poverty rates (18% vs. 12%). Mean household incomes and housing values in host neighborhoods are about 20% lower than those in non-host areas (\$48,400 vs. \$60,000 and \$136,900 vs. \$173,700, respectively). These racial and socioeconomic disparities are statistically significant ($p < 0.001$).

Table 4: Racial and Socioeconomic Disparities between Host Neighborhoods and Non-Host Areas of Commercial Hazardous Waste Facilities in Metropolitan Areas

	Host Neighborhoods	Non-Host Areas	Difference	Ratio
Population				
Total Population (1000s)	9,035	216,920	-207,885	0.04
Population Density	1,040	120	920	8.67
Race/Ethnicity				
% People of Color	56.6%	33.1%	23.5%	1.71
% African American	20.1%	12.8%	7.3%	1.57
% Hispanic or Latino	27.4%	13.7%	13.8%	2.01
% Asian/Pacific Islander	6.8%	4.4%	2.4%	1.56
Socioeconomics				
Poverty Rate	18.3%	11.6%	6.8%	1.59
Mean Household Income	\$48,391	\$60,438	-\$12,048	0.80
Mean Housing Value	\$136,880	\$173,738	-\$36,858	0.79

NOTES: Differences and ratios are between host neighborhood and non-host area percentages. Differences may not precisely match other values due to rounding off. Population density is persons per square kilometer (rounded off). Mean housing values pertain to owner-occupied housing units.

One hundred and five of the 149 MAs with facilities (70%) have host neighborhoods with disproportionately high percentages of people of color, and forty-six of these MAs (31%) have majority people of color host neighborhoods. These MAs are widely distributed across the country. MAs with large disparities in Hispanic or Latino percentages are also located in all regions, whereas MAs with large disparities in African American percentages are located primarily in the South and Midwest.¹³⁰

Host neighborhoods in the ten MAs with the largest number of people of color living in the host areas have a total of 3.12 million people of color, which is 60% of the total population of people of color in all hazardous waste

¹³⁰ For descriptive and multivariate statistics for selected metropolitan areas, see TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 79–83.

host neighborhoods in the country (5.16 million). Six metropolitan areas account for half of all people of color living in close proximity to all of the nation's commercial hazardous waste facilities: Los Angeles, New York, Detroit, Chicago, Oakland, and Orange County, CA. Los Angeles alone accounts for 21% of the people of color in host neighborhoods nationally.

In sum, there is no doubt that significant racial disparities exist within the nation's MAs, which contain four out of every five commercial hazardous waste facilities. Racial disparities exist in a large majority of MAs that have facilities (105 out of 141) and these MAs are widely distributed throughout the country. The magnitude of these disparities is often quite substantial. Moreover, these disparities are not confined to a single racial group but can be found among African Americans, Hispanics, and Asians/Pacific Islanders. The significant disparities found when separately examining the nation's MAs as a whole, as well as individual MAs, demonstrate the robustness of the findings and underscore those of the national and state analyses.

D. The Matter of Race

Toxic Wastes and Race in the United States found race to be more important than socioeconomic status in predicting the location of the nation's commercial hazardous waste facilities.¹³¹ Thus, it is appropriate to ask whether the racial disparities reported above in the current distribution of hazardous wastes are a function of neighborhood socioeconomic characteristics. Because race is often highly correlated with socioeconomic status, it is difficult to tell if race plays an independent role in accounting for facility locations without conducting statistical tests (i.e., multivariate analyses) to isolate the effect of race alone.

To determine the independent effect of race, socioeconomic factors believed to be associated with race must be statistically controlled. Table 5 shows the results of the multivariate analysis with the race and socioeconomic variables separately grouped. All race variables (percentages of Hispanics, African Americans, and Asians/Pacific Islanders) are highly significant independent predictors of the facility locations ($p < 0.001$). The positive coefficient (B) indicates that the higher the people of color percentages, the more likely a census tract is to be within three kilometers of a commercial hazardous waste facility. Among the indicators of socioeconomic status, mean income and percent employed in blue collar occupations are significant predictors ($p < 0.001$). These variables are therefore independently associated with hazardous waste facility locations. Mean housing value is statistically significant ($p < 0.002$), but in an unexpected direction (i.e., it has a positive coefficient).

¹³¹ TOXIC WASTES AND RACE, *supra* note 2, at 13.

Table 5: Multivariate Analysis Comparing Independent Effect of Race on Facility Location (Logistic Regression)

	Coefficient (B)	Est. Odds Ratio (Exp(B))	Significance Level
<i>Race/Ethnicity</i>			
% Hispanic or Latino	2.222	9.226	0.000
% African American	1.752	5.768	0.000
% Asian/Pacific Islander	3.583	35.964	0.000
<i>Socioeconomic Status Indicators</i>			
Mean Household Income (\$1000s)	-0.011	0.989	0.000
Mean Housing Value (\$1000s)	0.001	1.001	0.002
% with 4-Year College Degree	0.769	2.158	0.058
% Employed in Professional "White Collar" Occupations	-0.695	0.499	0.167
% Employed in "Blue Collar" Occupations	2.427	11.321	0.000
Constant	-4.453	0.012	0.000
-2 Log Likelihood	16977.135		
Model χ^2 (df=8)	1683.086		0.000

NOTES: Analysis uses 2000 Census tract data and 50% areal containment method (see Figure 1C).

Some socioeconomic variables are not statistically significant. For example, the percentage employed in management and professional (i.e., white collar) occupations is not a significant predictor. Likewise, the percentage of persons with a college degree does not quite achieve the threshold ($p < 0.05$) necessary to be considered statistically significant, though it is trending that way. It also has a positive coefficient, which is in the unexpected direction. The results show that race continues to be a significant and robust predictor of commercial hazardous waste facility locations when socioeconomic and other non-racial factors are taken into account.

VII. CONCLUSIONS AND POLICY RECOMMENDATIONS

Twenty years after the release of *Toxic Wastes and Race*, significant racial and socioeconomic disparities persist in the distribution of the nation's commercial hazardous waste facilities. Although the current assessment uses newer methods that better match where people and

hazardous waste facilities are located, the conclusions are very much the same as they were in 1987. In fact, people of color are found to be more concentrated around hazardous waste facilities than previously shown. People of color are particularly concentrated in neighborhoods and communities with the greatest number of hazardous waste facilities. Furthermore, racial disparities are widespread throughout the country, whether one examines states or metropolitan areas. Race clearly still matters.

Significant racial and socioeconomic disparities exist today despite the considerable societal attention to the problem noted previously. These findings raise serious questions about the ability of current policies and institutions to adequately protect people of color and the poor from toxic threats.

Getting government to respond to the needs of low-income and people of color communities has not been easy, especially in recent years when the EPA, the governmental agency millions of Americans look to for protection, has mounted an all-out attack on the environmental justice and environmental justice principles established in the early 1990s. It has not been easy fending off attacks and proposals from the EPA that would dismantle or weaken the hard-fought gains made by individuals and groups that put their lives on the front line. Moreover, the agency has failed to implement Environmental Justice Executive Order 12,898 signed by President Bill Clinton in 1994 or apply Title VI of the Civil Rights Act.

Many of the environmental injustice problems that disproportionately and adversely affect low-income and people of color communities could be eliminated if current environmental, health, housing, land use and civil rights laws were vigorously enforced in a nondiscriminatory way. Many of the environmental problems facing low-income persons and people of color are systemic and will require institutional change, including new legislation. However, government alone cannot solve these problems and the support and assistance of concerned individuals, groups, and organizations from various walks of life are needed.

The *Toxic Wastes and Race at Twenty* report gives over twenty recommendations for action at the federal, state, and local levels to help eliminate the disparities.¹³² The report also makes recommendations for nongovernmental agencies and the commercial hazardous waste industry.¹³³ More than 100 environmental justice, civil rights, human rights, faith-based, and health allies signed a letter calling for steps to reverse the downward spiral.¹³⁴ The sign-on letter and the organizations

¹³² TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 156–59.

¹³³ *Id.* at 159–60.

¹³⁴ Open Letter from Robert Bullard, Director, Environmental Justice Resource Center, et al., to Members of Congress, *Toxic Wastes and Race at Twenty, 1987–2000: Grassroots Struggles to Dismantle Environmental Racism in the United States* (July 20, 2007), available at http://www.ejrc.cau.edu/TWART_Letter_Congress.pdf.

endorsed the following ten policy recommendations from the *Toxic Wastes and Race at Twenty* report:¹³⁵

1. **Hold Congressional Hearings on EPA Responses to Contamination in EJ Communities.** We urge the U.S. Congress to hold hearings on the EPA's response to toxic contamination in EJ communities, including post-Katrina New Orleans, the Dickson County (Tennessee) Landfill water contamination problem, and similar problems throughout the United States.
2. **Pass a *National Environmental Justice Act Codifying the Environmental Justice Executive Order 12,898.*** Executive Order 12,898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations¹³⁶ provides significant impetus to advance environmental justice at the federal level and in the states. Congress should codify Executive Order 12,898 into law. Congress will thereby establish an unequivocal legal mandate and impose federal responsibility in ways that advance equal protection under law in communities of color and low-income communities.
3. **Provide a Legislative "Fix" for Title VI of the Civil Rights Act of 1964.** Work toward a legislative "fix" of Title VI of the Civil Rights Act of 1964¹³⁷ that was gutted by the 2001 *Alexander v. Sandoval*¹³⁸ U.S. Supreme Court decision that requires intent, rather than disparate impact, to prove discrimination. Congress should act to re-establish that there is a private right of action for disparate impact discrimination under Title VI.
4. **Require Assessments of Cumulative Pollution Burdens in Facility Permitting.** EPA should require assessments of multiple, cumulative, and synergistic exposures, unique exposure pathways, and impacts to sensitive populations in issuing environmental permits and regulations.
5. **Require Safety Buffers in Facility Permitting.** The EPA, states, and local governments too, should adopt site location standards requiring a safe distance between a residential population and an industrial facility. It should also require locally administered Fenceline Community Performance Bonds to provide for the recovery of residents impacted by chemical accidents.
6. **Protect and Enhance Community and Worker Right-to-Know.** Reinstate the reporting of emissions and lower reporting thresholds to the Toxic Release Inventory (TRI) database on an annual basis to protect communities' right to know.
7. **Enact Legislation Promoting Clean Production and Waste Reduction.** State and local governments can show leadership in reducing the demand for products produced using unsustainable technologies that harm human health and the environment. Government must use its

¹³⁵ TOXIC WASTES AND RACE AT TWENTY, *supra* note 11, at 156–60.

¹³⁶ Exec. Order No. 12,898, 59 Fed. Reg. 7629 (Feb. 11, 1994).

¹³⁷ 42 U.S.C. §§ 2000d–2000d-4 (2000).

¹³⁸ 532 U.S. 275 (2001).

buying power and tax dollars ethically by supporting clean production systems.¹³⁹

8. **Adopt Green Procurement Policies and Clean Production Tax Policies.** Require industry to use clean production technologies and support necessary R&D for toxic use reduction and closed loop production systems. Create incentives and buy-back programs to achieve full recovery, reuse, and recycling of waste and product design that enhances waste material recovery and reduction.¹⁴⁰
9. **Reinstate the Superfund Tax.** Congress should act immediately to reinstate the Superfund Tax, re-examine the National Priorities List (NPL) hazardous site ranking system, and reinvigorate Federal Relocation Policy in communities of color to move those communities that are directly in harms way.
10. **Establish Tax Increment Finance (TIF) Funds to Promote Environmental Justice-Driven Community Development.** Environmental justice organizations should become involved in redevelopment processes in their neighborhoods to integrate brownfields priorities into long-range neighborhood redevelopment plans. This will allow for the use of Tax Increment Finance funds for cleanup and redevelopment of brownfields sites expressly for community-determined uses.

The Executive Summary of the *Toxic Wastes and Race at Twenty* report was released in February 2007 at the annual meeting of the American Association for the Advancement of Science (AAAS) in San Francisco. The full report was released a month later in March at the National Press Club in Washington, D.C. Since the 2007 UCC report's release, two environmental justice hearings were held before the 110th Congress.

In July, the U.S. Senate Subcommittee on Superfund and Environmental Health held a hearing on the "Oversight of the EPA's Environmental Justice Programs," the first ever Senate hearing on environmental justice.¹⁴¹ And in October, the House Committee on Energy and Commerce's Subcommittee on Environmental and Hazardous Materials convened a hearing on

¹³⁹ See generally APOLLO ALLIANCE & URBAN HABITAT, COMMUNITY JOBS IN THE GREEN ECONOMY 12-13 (2007), available at <http://urbanhabitat.org/files/Community-Jobs-in-the-Green-Economy.pdf> (discussing means by which local governments can influence growth of a clean economy).

¹⁴⁰ See Hess & Winner, *supra* note 121, at 391 (discussing ways city governments could act to enhance development of reuse industry); BEVERLY THORPE, CITIZENS GUIDE TO CLEAN PRODUCTION (1999), available at <http://sustainableproduction.org/downloads/C%20Guide%20Text.pdf> and <http://sustainableproduction.org/downloads/C%20Guide%20References.pdf> (discussing clean production technology and implementation recommendations including tax policies); BEVERLY THORPE & MARK ROSSI, BACKGROUND PAPER FOR REFORM NO. 1 OF THE LOUISVILLE CHARTER FOR SAFER CHEMICALS 4-5 (2005), available at http://www.cleanproduction.org/library/Louisville_Charter_Substitution.pdf (proposing elimination of subsidies in favor of green taxes).

¹⁴¹ *Oversight of the EPA's Environmental Justice Programs: Hearing Before the U.S. Senate Committee on Environment and Public Works, Subcommittee on Superfund and Environmental Health*, 110th Cong. (2007), available at http://epw.senate.gov/public/index.cfm?FuseAction=Hearings.Hearing&Hearing_ID=e435eef8-802a-23ad-4ee0-916274d94170.

“Environmental Justice and the Toxics Release Inventory Reporting Program: Communities Have a Right to Know.”¹⁴² In September, Representative James E. Clyburn (D-SC) hosted the Congressional Black Caucus Environmental Justice Forum, which addressed “Environmental Justice: Federal Efforts to Strengthen Environmental Justice Through Enforcement of Civil Rights.”¹⁴³

Also, more than a half dozen bills have been introduced into Congress. Many of these bills cite the report findings and conclusions. The bills include:

*H.R. 1055 and S. 595 - Toxic Right-To-Know Protection Act.*¹⁴⁴ To legislatively restore the stronger reporting thresholds that were in place for almost twenty years. The bill would remove EPA’s authority to alter the program’s reporting requirements without the approval of Congress.

*H.R. 1103 and S. 642 - Environmental Justice Act of 2007.*¹⁴⁵ To codify Executive Order 12,898, to require the Administrator of the Environmental Protection Agency to fully implement the recommendations of the Inspector General of the Agency and the Comptroller General of the United States, and for other purposes.

*H.R. 1602 - Hurricanes Katrina and Rita Environmental Justice Act of 2007.*¹⁴⁶ To ensure environmental justice in the areas affected by Hurricanes Katrina and Rita.

*H.R. 1972 - Community Environmental Equity Act.*¹⁴⁷ To amend the Public Health Service Act to prohibit discrimination regarding exposure to hazardous substances, and for other purposes.

*H.R. 4652 - Environmental Justice Access and Implementation Act of 2007.*¹⁴⁸ To direct each Federal agency to establish an Environmental Justice Office, and for other purposes.

*H.R. 5132 and S. 2549 - Environmental Justice Renewal Act.*¹⁴⁹ To require the Administrator of the Environmental Protection Agency to establish an Interagency Working Group on Environmental Justice to provide guidance to Federal agencies on the development of criteria for identifying disproportionately high and adverse human health or environmental effects on minority populations and low-income populations, and for other purposes.

¹⁴² *Environmental Justice and the Toxics Release Inventory Reporting Program: Communities Have a Right to Know: Hearing on H.R. 1103 Before the Committee on Energy and Commerce, Subcommittee on Environment and Hazardous Materials*, 110th Cong. (2007), available at http://energycommerce.house.gov/cmte_mtgs/110-ehm-hrg.100407.EnvironmentalJustice.shtml.

¹⁴³ Lauren Trevisan, *The Environmental Justice Braintrust: A Dispatch from the Congressional Black Caucus Conference*, <http://gristmill.grist.org/story/2007/10/2/133513/553/> (last visited Apr. 13, 2008); Environmental Justice Blog, *Congressional Black Caucus EJ & Energy Forums 2007*, <http://environmentaljusticeblog.blogspot.com/2007/09/congressional-black-caucus-ej-energy.html> (last visited Apr. 13, 2008).

¹⁴⁴ H.R. 1055, 110th Cong. (2007); S. 595, 110th Cong. (2007).

¹⁴⁵ H.R. 1103, 110th Cong. (2007); S. 642, 110th Cong. (2007).

¹⁴⁶ H.R. 1602, 110th Cong. (2007).

¹⁴⁷ H.R. 1972, 110th Cong. (2007).

¹⁴⁸ H.R. 4652, 110th Cong. (2007).

¹⁴⁹ H.R. 5132, 110th Cong. (2008); S. 2549, 110th Cong. (2008).

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H.R. 398 - Healthy Places Act of 2007 and *S. 1068 - Healthy Communities Act of 2007*.¹⁵⁰ To require the Secretary of Health and Human Services to establish an interagency working group to discuss environmental health concerns, particularly concerns disproportionately affecting disadvantaged populations.¹⁵¹

Getting government to respond to the environmental and health concerns of low-income and people of color communities has been an uphill struggle. Achieving environmental justice for all makes us a much healthier, stronger, and more secure nation as a whole. More important, it's the just and right thing to do.

¹⁵⁰ H.R. 398, 110th Cong. § 3(b) (2007); S. 1068, 110th Cong. (2007).

¹⁵¹ *Id.*